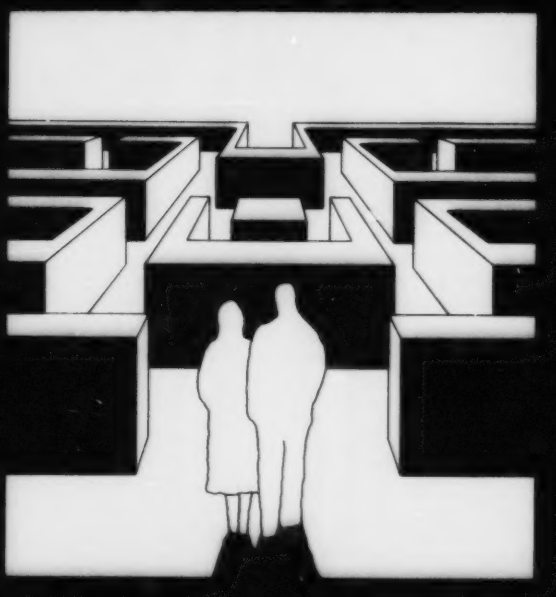
The Taxation of Income from Capital in Canada



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Foreword

This study is a revised version of a paper presented at the International Conference on the Cost of Capital held at Harvard University in November 1987. The main purpose of the conference was to provide participants from various countries with a forum in which to discuss recent international trends in the taxation of income from capital and their impact on the cost of capital.

The research contained in this study is one of the products of the Council's three-year inquiry into the taxation of capital income – or the income derived from savings and investment. The inquiry had dimensions both in time and space. The effects of capital taxation on both present and future output and standards of living were scrutinized. Taxes levied by all levels of government in Canada were studied, as were the international implications of the taxation of capital income. Another important emphasis in the study program was on the interrelationship between specific measures of capital taxation. Here, general equilibrium and other techniques were used to examine the various measures as an interrelated system. Separate studies were also undertaken of specific measures of capital taxation including the personal and corporation income taxes, sales and transactions taxes, property taxes, and resource taxes.

The present study assesses the impact of recent tax-reform measures on the pattern of saving and investment incentives in Canada.

Judith Maxwell
Chairman

1 Introduction

The haphazard taxation of income from capital and its distortionary impact on the incentive to save and invest have been a source of growing concern in most major western economies during the past few years. Attempts to analyse the situation in a comprehensive manner culminated in the well-known comparative study by King and Fullerton (1984) of the tax systems of the United States, the United Kingdom, Sweden, and West Germany. This study of the corporate sector showed not only that marginal effective tax rates on income from capital differ widely between countries but, perhaps more importantly, that effective tax rates on new investments can vary enormously within countries depending upon the type of asset acquired, the industry in which the asset is used, the manner in which the investment is financed, and the tax status of the saver supplying the funds.

Unlike the authors of most previous studies, King and Fullerton did not confine their attention to an evaluation of corporate income taxes alone. Instead, they took into account the interaction between corporation, personal, wealth, and property taxes. Although various taxes often tend to have an additive effect, consideration of a particular tax in isolation can be misleading insofar as the distortions resulting from one tax counteract or amplify those arising from another. Not surprisingly, the framework provided by King and Fullerton has spawned a series of similar studies of other countries, including Canada.[1]

The manner in which investment income is taxed in Canada should be of concern to all Canadians. A tax system that departs from neutrality by giving preferential treatment to some forms of capital income shifts the tax burden onto wage-earners, consumers, and the recipients of capital income in forms that the tax system does not favour. Moreover, a non-neutral tax system diverts capital resources from their most productive uses – that is, those with the highest rates of return before taxes – into activities that are less productive but that yield greater after-tax returns because of the preferential tax treatment they enjoy. Non-neutralities also encourage taxpayers (firms as well as individuals) and their advisers to devote real resources to the discovery of ways in which to convert one type of income into another (for example, dividends into capital gains or vice versa) in order to minimize their tax liabilities, a practice that in its turn creates a need for further legal constraints to prevent tax avoidance. The multiplication of constraints has created an unnecessarily complex and constantly changing tax system – a system that entails real costs for firms, individuals, and the tax authorities. The result is less productivity and national output, and thus lower living standards for capital owners and wage-earners alike. Furthermore, the existing tax system as a whole favours current consumption over saving, a departure from neutrality that tends to discourage investment, thereby impeding economic growth and jeopardizing the future living standards of all groups in society.

One of the principal objectives of the federal government's recent White Paper entitled *Tax Reform 1987* is to increase the neutrality of the tax system and ensure that decisions to save and invest are based on economic rather than tax considerations. The government plans to achieve this objective in two ways: by reducing, and in some cases removing, certain tax concessions, thereby broadening the tax base, and by lowering statutory tax rates. These measures are designed to accelerate a process already begun by changes announced in the 1986 federal budget.

The purpose of this study is threefold. First, using the theoretical framework developed by King and Fullerton (1984), marginal effective tax rates for Canada are computed, taking into account not just corporation, personal, and business property taxes, but also sales taxes levied on purchases of capital inputs. Although these sales taxes are especially important in the case of Canada, they have generally been ignored by studies involving the computation of marginal effective tax rates. By including such taxes in the calculations reported in this study, a more complete picture of the pattern of marginal effective tax rates is provided than that found in previous studies. The overall marginal effective tax rate is then separated into various components corresponding to each particular tax so as to determine their relative contribution to the total tax wedge as well as to the variation in total tax rates.

Second, the King and Fullerton methodology for computing marginal effective tax rates is extended to noncorporate business investment and to owner-occupied housing. This enables us to determine not only the extent to which the tax system distorts the pattern of investment incentives within the noncorporate sector, but also the degree to which

it discriminates against investments in the corporate sector compared to those in the noncorporate sector.

Third, we evaluate the impact of tax reform on investment and saving incentives in Canada. In addition, we compare these incentives with those provided by the tax systems of Canada's main trading partners, the United States, the United Kingdom, and Japan.

The rest of this study is organized as follows. The next chapter contains a brief description of the methodology used to derive marginal effective tax rates. Chapter 3 summarizes the main features of the Canadian tax system, both before and after recent tax reforms, together with the tax parameters used to compute marginal effective tax rates. Estimates of marginal effective tax rates for Canada, including those arising from tax-reform proposals, are reported in Chapter 4. In Chapter 5, estimates of marginal effective tax rates for Canada are compared with those of the United States, the United Kingdom, and Japan. Finally, some concluding comments are found in Chapter 6.

2 Theoretical Framework

The marginal effective tax rates for Canada reported later in this study are derived from the cost of capital, as defined by Hall and Jorgenson (1967), using the methodology developed by King (1977) and King and Fullerton (1984). However, unlike in the study by King and Fullerton (1984), marginal effective total tax rates are separated into various components corresponding to each particular tax in order to ascertain their relative contribution to the total tax wedge, as well as to the variation in marginal effective tax rates. Furthermore, the King and Fullerton methodology is adapted and applied here to the taxation of capital income in the noncorporate business sector and owner-occupied housing in a manner similar to that followed by Fullerton (1987).

Marginal Effective Tax Rates

Most discussion regarding the effective tax rates on capital income and their impact on investment tends to focus on the total taxes paid out of corporate profits – that is, on the average effective corporate tax rate.[1] Although this approach may be appropriate for measuring the burden of taxes on corporate profits, it can be extremely misleading because it ignores the interaction between the corporation and the personal tax systems and because it fails to reflect the incentive to undertake new investments. Thus, what concerns us in this study are marginal effective tax rates: marginal, because a potential investor's concern is the tax on the new investment, not the tax observed on past or average investment; effective, because the combination of corporation and personal taxes, as well as the availability of various credits and deductions, means that actual rates may diverge markedly from statutory rates.[2]

To calculate marginal effective tax rates on income from capital in the corporate sector, we follow the approach taken by King and Fullerton (1984). Using a series of hypothetical marginal investment projects, we compute the tax wedge between the rate of return on the project and the rate of return on savings used to finance it. The size of this wedge depends upon the corporation tax system (including depreciation allowances, investment tax credits, and other deductions), upon the personal tax system and the way it treats interest, dividend, and capital gains income, as well as upon business property taxes and sales taxes on capital goods.

For our purposes, investment projects have four distinct characteristics: 1) the type of asset purchased – machinery, buildings, or inventories; 2) the industry in which the investment is made – manufacturing, commerce, or other industry; 3) the manner in which the investment is financed – debt, new share issues, or retained earnings; and 4) the category of investor supplying the funds – a household, a tax-exempt institution, or an insurance company. These characteristics can be combined into 81 hypothetical projects (3 assets × 3 industries × 3 methods of finance × 3 categories of owners); we estimate the marginal effective tax rate for each.

Although we separate these estimates into components relating to corporate taxes (including or excluding business property taxes and sales tax levied on capital goods) and the personal tax, we also derive an overall measure in order to capture the interaction between the two tax systems. For example, interest payments that are tax-deductible for a corporation are taxed upon receipt by an individual. The dividend tax credit also integrates the corporation and personal tax systems to some extent.

In our calculations, the total tax wedge, w, is the difference between p, the real rate of return on investment net of depreciation, and s, the after-tax real rate of return on savings used to finance the investment. Thus, the marginal effective *total* tax rate is defined as

$$t = w/p = (p - s)/p. \tag{2.1}$$

The total tax wedge can be separated into two components: w_1, the corporate tax wedge (which includes business property taxes as well as sales taxes levied on capital goods), and w_2, the personal wedge. They are defined respectively as $w_1 = p - x$ and $w_2 = x - s$, where x denotes an investment project's real rate of return after corporate income taxes, property taxes, and sales taxes, but before personal taxes. Hence,

$$t_c = w_1/p = (p - x)/p \tag{2.2}$$

and

$$t_p = w_2/x = (x - s)/x, \tag{2.3}$$

where t_c is the marginal effective *corporate* tax rate (inclusive of property and sales taxes), and t_p is the marginal effective *personal* tax rate.[3] If property and sales taxes are excluded and only the corporation tax is involved, t_c is defined as the marginal effective *corporation* tax rate.

In the case of debt-financed investment, $x = i - \pi = r$, where i is the nominal market interest rate, π denotes the expected annual rate of inflation, and r is the real interest rate. For investment financed by new share issues or retained earnings $x = \rho - \pi$, where ρ denotes an investment project's rate of return net of corporation taxes, business property taxes, and sales taxes levied on purchases of capital goods. As we shall see later, ρ also denotes the firm's discount rate.

Note that if investment is financed by domestic saving, i and ρ are determined domestically, and the total tax rate, t, reflects the incentive or disincentive to invest provided by the tax system. On the other hand, if Canada can be considered a small open economy and capital is perfectly mobile internationally, then i and ρ are instead determined on world capital markets. Consequently, it is the corporate tax rate, t_c, rather than the total tax rate, t, that is relevant for domestic investment decisions. These issues are discussed at greater length later in this chapter.

The rate of return the company pays on the saver's financial claims is the crucial link between the company carrying out the investment and the saver providing funds. If, for example, the money goes to the company in the form of a fixed-interest loan, the company must pay the market interest rate on the loan. As already explained, we denote the real rate of interest on such corporate debt by r and the corresponding nominal interest rate by i, so that $r = i - \pi$.

For any given investment project, we can ask what minimum rate of return it must yield before taxes in order to provide the saver with the same net-of-tax return he or she would receive from lending at the market rate of interest. This minimum pre-tax rate of return is called the cost of capital and denoted as c. The relation between the cost of capital and the real rate of interest can be expressed as

$$p = c(r), \tag{2.4}$$

where $c(r)$, the cost-of-capital function, depends on the industry in which the investment is undertaken, the type of capital purchased, the method of finance used, the kind of saver supplying the funds, and, of course, the tax structure.

Notice that equation 2.4 can be interpreted in either of two ways:

1) It can be considered an expression of capital market equilibrium determining the minimum rate of return that various types of investments financed in different ways must yield for profit-maximizing firms operating in an economy with a given real interest rate. In this case, p, the real rate of return on investment (net of depreciation), is determined by r, the real rate of interest.

2) It can be viewed as indicating the maximum interest rate at which savers are indifferent between lending at this rate and receiving the after-tax proceeds on a given investment financed so as to yield a given pre-tax return of p. Here r is determined by p.

For the reasons explained later in this chapter, we assume the latter situation – a fixed p determining the real rate of return.

The relation between i, the market interest rate, and s, the net return to the saver, is determined by the personal tax system. Since taxes are levied on nominal interest income, the saver's post-tax real rate of return is

$$s = i(1 - m) - \pi, \tag{2.5}$$

where m denotes the marginal personal tax rate on interest income. Needless to say, the value of s depends upon the manner in which real investment is financed and the type of saver providing the funds (see Table A-1).

The tax wedges, and thus the marginal effective tax rates, are calculated for each of our 81 hypothetical projects using equations 2.1 through 2.5. All that remains is to devise an expression for the cost-of-capital function, $c(r)$, for each project.

For the unincorporated business sector the procedure for computing marginal effective tax rates is similar to the one used for the corporate sector. However, while we again have the same three types of asset and the same three industries, we only consider two methods of finance – debt and proprietors' equity – and one category of investor – households. Furthermore, since income from investment in the unincorporated business sector is not subject to corporate income taxes but is instead taxed at the personal level, only the total tax wedge is computed, again taking into account business property and sales taxes levied on capital goods. For owner-

occupied housing, only one asset is involved, with two possible methods of finance – debt and homeowners' equity – and again three categories of investors. The total tax wedge in this case is computed taking into account residential property taxes as well as personal taxes.

Cost of Capital

In deriving an expression for the cost of capital, $c(r)$, we shall assume that all the provisions of the tax code are known and constant over time, that there is perfect certainty, that capital markets are perfect, and that the inflation rate is constant over time. We shall also assume that the firm undertaking the investment has sufficient tax liability to enable it to claim all associated tax allowances, and that it does not resell the asset. A profit-maximizing firm contemplating a new investment project will, in equilibrium, equalize the net outlay on the investment with the present value of the investment's net returns. If the initial cost per unit of the asset is $\$(1 + h)$, and the present value of any tax allowances or grants given for the investment is denoted by A, then the net outlay is

$$C = (1 + h)(1 - A), \tag{2.6}$$

where h is the rate of sales tax levied on purchases of capital goods.

Following the notation used by King and Fullerton (1984), the present value of tax savings from depreciation allowances, investment tax credits, and other grants associated with a dollar of investment is

$$A = f_1 A_d + f_2 \tau + f_3 g, \tag{2.7}$$

where f_1 denotes the proportion of the cost of an asset that is entitled to standard depreciation allowances, f_2 is the proportion qualifying for immediate expensing at the corporation tax rate τ, and f_3 is the proportion eligible for grants or equivalent tax credits at the rate g. A_d denotes the present value of tax savings from standard depreciation allowances which are based on the cost of an asset net of the investment grant or tax credit.[4]

The unit of investment is assumed to generate returns whose nominal value increases with inflation and decreases with the rate of economic depreciation. The firm then discounts these returns at the nominal rate ρ. The present value of the profits from the investment net of taxes is given by

$$V = \int_0^D \left[(1 - \tau)(MRR - w_c) - d_1 \tau (\pi - \nu) \right] e^{-(\rho + \delta - \pi)u} du$$

$$= \frac{(1 - \tau)(MRR - w_c) - d_1 \tau (\pi - \nu)}{\rho + \delta - \pi} \tag{2.8}$$

where τ denotes the corporation tax rate, MRR the marginal rate of return, w_c the business property tax rate, ν the rate of inventory allowance, and δ the exponential rate of economic depreciation. The dummy variable d_1 takes the value of one for inventories and zero for everything else.

If the rate of return net of depreciation is

$$p = MRR - \delta, \tag{2.9}$$

and the net outlay, C, is set equal to the present value of the net returns, V, then equations 2.6, 2.8, and 2.9 can be solved to yield

$$p = \frac{\left[(1 + h)(1 - A)(\rho + \delta - \pi) + d_1 \tau (\pi - \nu) \right]}{(1 - \tau)} + w_c - \delta. \tag{2.10}$$

Since ρ is related to i and, therefore, to r, the right-hand side of equation 2.10 is the expression for $c(r)$, the cost of capital net of depreciation.

The discount rate, ρ, depends not only on the interest rate but also on the manner in which the investment is financed and the tax status of the entity providing the funds. Since nominal interest payments are tax-deductible at the corporate level, for debt finance

$$\rho = i(1 - \tau), \tag{2.11}$$

where i denotes the nominal rate of interest. In the case of new shares sold to households, potential investors require a rate of return equal to $i(1 - m)$, where m is the investor's marginal personal tax rate on interest income. If the project yields a return net of corporation, property, and sales taxes of ρ, the value of ρ must be such as to equate $\rho\theta(1 - m)$, the dividend net of personal taxes, with $i(1 - m)$, the investor's opportunity cost rate of return, where θ equals the additional dividend shareholders receive if one unit of post-corporation-tax earnings is distributed. If follows that

$$\rho = i/\theta. \tag{2.12}$$

Similarly, if retained earnings are the method of finance (so the rate of return, ρ, is subject to capital gains tax instead of

income tax), the household investor requires a yield such that $\rho(1 - z) = i(1 - m)$, where z is the effective tax rate on accrued capital gains. Hence, the discount rate associated with retained earnings is[5]

$$\rho = i(1 - m)/(1 - z). \tag{2.13}$$

If the investor is a tax-exempt institution, such as a pension fund, the firm's discount rate for new share issues and retained earnings is, of course, i, the nominal interest rate. For reasons explained in the next chapter, the appropriate discount rate for new shares sold to life insurance companies is $i(1 - \tau_l)$; for retained earnings, it is $i(1 - \tau_l)/(1 - z_l)$, where τ_l is the corporation tax rate on life insurance business and z_l is the effective accrued tax rate on capital gains realized by life insurance companies. The discount rates corresponding to each type of saver and method of finance are summarized in Table A-2 of Appendix A.

In the case of unincorporated business investment, the cost-of-capital expression is the same as that given by equation 2.10 except that the corporation tax rate τ is replaced by the unincorporated business proprietor's personal marginal tax rate n. In effect, this means that the tax treatment of noncorporate investment income is the same as that which could be achieved with full integration of corporate and personal income taxes. The proprietor's discount rate is then substituted for the corporation's discount rate.

Investment in owner-occupied housing does not receive any tax credits or depreciation allowances. Moreover, the imputed return from owner-occupied housing is nontaxable and neither mortgage interest payments nor residential property taxes are tax-deductible. The cost of capital corresponding to owner-occupied housing is, therefore,

$$c(r) = \rho - \pi + w_p, \tag{2.14}$$

where w_p denotes the residential property tax rate.

Tax Arbitrage Assumption

Following King and Fullerton (1984), our principal estimates of marginal effective tax rates are based on the "fixed-p" assumption whereby all investment projects earn a 10 per cent real pre-tax rate of return net of depreciation. We then compute the post-tax rate of return for each project. In general these post-tax returns differ across projects. The usefulness of this approach is that it highlights the differences in the tax treatment of different investments and provides a clear picture of the pattern of incentives provided by the tax system. Needless to say, one would expect funds to be reallocated from low-yield (high tax) projects to high-yield (low tax) ones. Such tax arbitrage tends to eliminate differences in the real post-tax rates of return between projects. At the same time, however, it leads to differences in pre-tax rates of return on different investments, thereby distorting the allocation of resources. Hence one would not expect to observe the same p on all projects in actual equilibrium. Capital market equilibrium could take many forms.

The "fixed-r" scenario adopted by King and Fullerton (1984) assumes that tax arbitrage leads to a situation in which all savers receive the same real return r before personal taxes on each project (as on a bond having a prespecified real interest rate of 5 per cent per annum). Most of the King and Fullerton fixed-r calculations also assume that a one-point increase in the inflation rate causes the market interest rate to rise by $1/(1 - \bar{m})$ points, where $\bar{m}$ is the weighted average of different owners' personal marginal tax rates. The latter assumption ensures that the real return to savers is constant across inflation rates.[6]

Alternatively, one could follow Bradford and Fullerton (1981) and assume a situation in which arbitrage takes place at the firm level – that is, firms arbitrage between real capital and debt in order to equalize their net-of-tax returns. Since retiring a unit of debt saves nominal interest i net of corporation tax at the rate $i(1 - \tau)$, where τ is the corporation tax rate, a new investment in any asset, whatever the source of finance, must earn the same return.[7] If firms do arbitrage successfully between debt and real capital, then the real after-tax return they earn on an investment must be the same as the real net of corporation tax interest saved by retiring a bond. Hence in the case of firm arbitrage it is more appropriate to assume that a one-point increase in inflation results in a $1/(1 - \bar{\tau})$ points rise in the nominal interest rate, where $\bar{\tau}$ is the weighted average of corporation tax rates.

Another possibility, at least as far as an open economy like Canada is concerned, is to assume that the costs of debt and equity finance to Canadian corporations are fixed on international capital markets.[8] With perfect international capital mobility, arbitrage would occur in order to ensure that the real rate of return to U.S. investors, before personal taxes, is some given amount on both U.S. and Canadian corporate bonds. Such an approach has been followed by Boadway, Bruce, and Mintz (1984) and by the Department of Finance (1985). It assumes that changes in the value of the Canadian dollar relative to its U.S. counterpart are determined solely by differences in expected inflation rates between the two countries. Denoting U.S. variables with an asterisk, and defining the exchange rate, e, as the Canadian

dollar price of U.S. currency, the proportionate change in the exchange rate is given by

$$\dot{e}/e = \pi - \pi^*, \tag{2.15}$$

where π is the expected inflation rate. It is also assumed that any appreciation in the exchange rate is treated as capital gains for tax purposes. With complete arbitrage in international capital markets, the real after-tax return to U.S. investors must be the same on both U.S. and Canadian debt. Consequently, the rate of return on Canadian bonds must be such that

$$i(1 - m^*) - (1 - z^*)\,\dot{e}/e = i^*(1 - m^*), \tag{2.16}$$

here m^* is the U.S. investor's marginal personal tax rate on interest income, and z^* is the effective accrued tax rate on capital gains. Similarly, the rate of return on Canadian shares, ρ, must be such that

$$\rho(1 - m^*) - (1 - z^*)\,\dot{e}/e = \rho^*(1 - m^*), \tag{2.17}$$

where ρ^* is the rate of return on U.S. equity. Equation 2.16 implies that a one-point increase in the Canadian inflation rate leads to a $(1 - z^*)/(1 - m^*)$ increase in the Canadian interest rate. Some additional implications of international capital mobility are discussed in the next section.

Unfortunately, as the foregoing discussion suggests, there is very little agreement among economists as to what constitutes an appropriate capital market equilibrium for the purpose of calculating marginal effective tax rates. Since the fixed-p calculations are independent of any tax arbitrage assumption, they are a better guide to the tax schedule faced by different projects. By contrast, the distribution of marginal effective tax rates based on an appropriate tax arbitrage assumption determines the welfare losses resulting from the distortionary nature of the taxation of income from capital. Our emphasis on the fixed-p case reflects our primary interest in the effect of the Canadian tax system on the incentive to invest. We do, however, report estimates of marginal effective tax rates for the fixed-r case in Appendix B. It is noteworthy that an examination by Daly and Jung (1987) of the sensitivity of marginal effective tax rate estimates to the three-tax arbitrage assumptions discussed above revealed the pattern of marginal effective tax rates to be similar irrespective of the arbitrage assumption used.

Some Caveats

The marginal effective tax rates reported in the next chapter assume that firms (and individual investors) are able to fully use all the tax allowances for which new investments qualify. This implies that firms (and individuals) have sufficient taxable income or tax liabilities against which the exemptions, deductions, and credits for new investments can be offset or, equivalently, that net profits and losses are treated symmetrically by the tax system. Symmetric tax treatment of net profits and losses involves full loss-offsetting so that a credit or refund for losses is given at the same rate as taxes are levied on net profits. Although unused tax losses can be carried forward (and backward), the period over which they can be spread is limited. Moreover, the postponement of tax reductions to future years in which taxable income is positive results in interest being forgone. Consequently, loss-offsetting for tax purposes is far from complete, which means that the marginal effective tax rates applicable to investments undertaken by "tax-exhausted" companies could be rather different from those reported in this study.

Nor is the risk associated with investments explicitly taken into account in computing marginal effective tax rates. Nevertheless, insofar as risk arises as a consequence of the uncertainty of future income streams from new investments ("income" risk) and full loss-offsetting is allowed, so that the government shares symmetrically in both gains and losses, the marginal effective tax rate applicable to riskless investments is exactly the same as that on investments involving income risk. Our calculations of marginal effective tax rates do not, however, take into account "capital" risk, that is, the risk due to uncertainty over physical depreciation, obsolescence, or future prices of capital goods.[9]

It should also be pointed out that the marginal effective total tax rates reported in the next section may not be entirely appropriate for a small open economy like Canada, because the estimates are based on the assumption that investments are financed by domestic savings. If capital is completely mobile between Canada and the rest of the world, only Canada's corporate tax system is relevant for domestic investment decisions, while Canada's personal tax system affect domestic saving decisions. Under such circumstances, the marginal effective corporate tax rate, t_c, reflects the tax incentive to invest in Canada, whereas the marginal effective personal tax rate, t_p, is indicative of the tax incentive to save. To the extent that capital is internationally immobile, however, marginal investments are necessarily financed by domestic savings, in which case domestic saving and investment decisions are interrelated. In such a situation, the marginal effective total tax rate reflects the tax incentive both to save and to invest in Canada. Interestingly, there does appear to be a very strong correlation between domestic saving and investment rates, a phenomenon which

indicates that capital may not be perfectly mobile internationally.[10]

Nonetheless, a considerable amount of investment in Canada has traditionally been financed with foreign savings. For example, nearly half of the capital employed in Canadian manufacturing is foreign-owned.[11] Most new foreign direct investment in Canada is undertaken by "mature" foreign-owned subsidiaries which finance new investment from their retained earnings. The parent companies of these subsidiaries are based mainly in the United States. Since U.S. income taxes and Canadian withholding taxes are not levied on subsidiaries' income until it is remitted, multinational companies have an incentive to defer patriation of such income in order to postpone (or avoid) any extra taxes payable upon remittance. If these taxes are deferred long enough, tax deferral by the United States is equivalent to exempting foreign-source income from tax because the net present value of the extra tax is zero.

However, in the case where subsidiaries' earnings are eventually remitted to the parent company, the latter cannot avoid the extra taxes due upon patriation. If the earnings are reinvested in Canada and earn the average after-tax rate of return, the net present value of the extra taxes payable upon patriation is the same no matter when patriation occurs, as long as the tax rate on patriated earnings is expected to remain unchanged. As all foreign earnings must bear the extra tax at some time, it can be considered a fixed cost that ought not to affect the parent company's decision whether to reinvest or to patriate profits earned by its subsidiaries.

The relevant question facing the multinational company is which location yields the highest rate of return net of local corporate taxes. Hence, the effective tax rate on foreign-source income is the host country's effective corporate tax rate, irrespective of whether the net present value of deferred taxes is zero or constant. It follows that the marginal effective tax rates levied on new investment in Canada by subsidiaries of U.S.- and other foreign-owned companies are similar to the marginal effective corporate tax rates, t_c, applicable to new investment in Canada by domestic companies.[12]

3 An Overview of the Canadian Tax System

Historical Background

Although first introduced by the federal government in 1917 as a temporary measure to defray the costs associated with the First World War, income taxes were never abandoned. Instead they became a permanent feature of the Canadian tax system. The importance of the personal tax has grown to such an extent that it is now the main source of revenue for federal and provincial governments combined, accounting for 34.5 per cent of total tax receipts in 1985, compared to only 19.5 per cent in 1955. In contrast, whereas the corporation tax yielded almost 19.5 per cent of total tax revenue in 1955, 30 years later its share of receipts had dropped to only 8.5 per cent. The contribution of sales and excise taxes to total revenue also fell, from 36.5 per cent in 1955 to 22.9 per cent in 1985. Over the same period, property taxes as a proportion of total tax revenue dropped very slightly, from 11.4 to 9.3 per cent.

Since the Second World War, Canada's income tax system has undergone a great many changes, many of which concerned the taxation of capital income and were aimed at promoting saving and investment. In 1949, following three years of study, a wholly-revised federal *Income Tax Act* was adopted. Among other things, the new legislation introduced the present system of capital cost allowances (CCAs) based on the declining balance method, as well as a dividend tax credit. Tax-deductible registered retirement savings plans (RRSPs) were introduced in 1957 to encourage personal saving for retirement.

Undoubtedly, however, the most important event in the evolution of the country's income tax system was the Carter Commission,[1] which published its report in 1966, after almost five years' study of Canada's tax system. The Carter report, a landmark in Canadian tax history, resulted in some major revisions to the *Income Tax Act* in 1972. While focusing much of its attention on the importance of fairness between taxpayers, the report also addressed a number of issues pertaining to the taxation of capital income, among them the adoption of a more comprehensive concept of income, closer integration of corporate and personal income taxes, and the achievement of greater neutrality in taxation through the elimination or reduction of incentive provisions. Strict adherence to these general principles would have required full taxation of capital gains (which were previously exempt), full crediting of corporate income tax against personal income tax for shareholders, elimination of many incentive features of the corporation tax, and an overhaul of the taxation of international income. Although, in 1969, the government released a white paper embracing many of the Carter Commission's ideas, public resistance resulted in considerably watered-down final legislation, which came into effect in 1972. This legislation required taxpayers to include one-half of realized capital gains in their taxable income, it revised and extended an existing credit for corporation taxes against personal income, it eliminated several "incentive" features of the corporation tax, and it reduced the top personal income tax rate. The legislation also repealed federal gift and death taxes, an example followed in later years by all provinces.

The acceleration in the rate of inflation after 1972 also resulted in major tax changes aimed at indexing the tax system. Personal income tax exemptions and tax brackets were indexed to the consumer price index (CPI) starting in 1974, thus preventing the rapid inflation of the mid- to late 1970s and early 1980s from raising real tax burdens by pushing taxpayers into higher tax brackets. Furthermore, part of the rationale for the $1,000 deduction for interest income, which was introduced in 1974 and subsequently extended to cover dividends and capital gains, was a desire to shelter from taxation the inflation premium component of interest for low-income taxpayers. Concern over the impact of inflation on the taxation of businesses prompted the government to provide some relief from the taxation of inflationary inventory profits that were created by "first-in-first-out" (FIFO) accounting methods; in 1977, the federal government introduced an income tax deduction equal to 3 per cent of the value of inventories held at the beginning of the tax year. The adverse impact of inflation on corporate cash flows was also a factor behind the enhancement of the investment tax credit and capital cost allowances.

All of these developments, together with other changes in both the structure and rates of tax, reveal four distinct trends with respect to the corporation and personal tax systems during the 1970s and early 1980s. First, we have witnessed an increasing degree of integration between corporate and personal income taxes through the dividend tax credit.[2] Second, notwithstanding the Carter Commission's emphasis on the desirability of a comprehensive income tax, we

have seen a gradual shift away from a tax system based on annual income to one based on a hybrid of lifetime income and expenditure, owing mainly to the rapid growth in tax-exempt saving through registered pension plans and RRSPs,[3] and to the $1,000 investment income deduction. Third, the preferential corporation tax rate on profits derived from manufacturing and processing in Canada, the three-year write-off for expenditures on machinery and equipment by firms engaged in manufacturing and processing,[4] and the increased use of the investment tax credits introduced in 1975 all reflect a trend toward encouraging investment in certain activities via the tax system.[5] This too is contrary to the views expressed by the Carter Commission. Finally, in an attempt to adjust the capital income tax system for the effects of inflation, a number of measures were introduced, notably, the $1,000 personal investment income deduction, the enhancement of the investment tax credit and capital cost allowances, the 3-per-cent inventory allowance, and Indexed Security Investment Plans (ISIPs).[6] These and other features of the corporation and personal tax structures are discussed at greater length in the remainder of this chapter.

The Tax System in 1985

The Corporation Tax

In 1985, the federal statutory corporation tax rate was 36 per cent. However, manufacturing income was taxed at the rate of 30 per cent, and for the first $200,000 of income of Canadian-controlled private corporations, small business rates of 10 and 15 per cent, respectively, were applicable to manufacturing and nonmanufacturing. Additional taxes are levied by provinces, again with reduced rates usually for small businesses and sometimes for manufacturing. The typical provincial rate in 1985 was approximately 14 per cent. Companies face different statutory tax rates, therefore, depending on their size, the province in which they are located, and the nature of their production activities. Consequently, as shown in Table A-3 of Appendix A, overall corporation tax rates, τ, vary considerably from one industry to another.

Tax incentives and other deductions mean, however, that a corporation's effective tax rate on investment income is usually well below the statutory rate. Accelerated capital cost allowances (CCAs) enable firms to write off certain investments for tax purposes long before the end of the assets' economic lives. For example, machinery used in the manufacture and processing of goods (CCA Class 29) could be written off after only three years, even though its economic life is estimated at over 18 years. By contrast, the tax lives of buildings correspond more closely to their economic lives. In addition, investment tax credits (ITCs) were available for new investments of specific types at rates that varied by type of asset, by industry, as well as by region (see Table A-4). Moreover, certain types of inventories qualified for a 3-per-cent allowance. Finally, interest payments on corporate debt are considered as a business expense so that they are deductible from profits for corporation tax purposes, whereas the costs of equity finance are not deductible. As a result, the corporation tax is only levied on income from investment financed by equity.

Business Property Taxes

Property tax rates also vary by type of asset and across industries, as shown in Table A-3. According to a recent survey,[7] business property taxes are levied mainly on land and buildings, with machinery being free of such taxes except insofar as it is used to service buildings. Although no precise estimates are available concerning the proportion of machinery involved in such servicing, it is probably fairly small. Hence, in our calculations the property tax rates given in Table A-3 are assumed to apply only to buildings (after adjusting for the taxes paid on land).

Sales Taxes

Federal sales taxes apply to all goods manufactured in Canada or imported into Canada. They are levied not only on goods for final domestic consumption, but also on machinery and equipment used in the production of domestic goods and on intermediate inputs. Provincial sales taxes, which are imposed at the retail level, are also applied to machinery and equipment and intermediate inputs in a manner similar to federal sales taxes. The federal and provincial sales taxes on machinery and equipment thus partly offset the preferential treatment of those assets under the corporation tax. According to the most recent estimates available, which are for 1980, 13.3 per cent of federal sales taxes and 8.6 per cent of provincial sales taxes were levied on business purchases of capital inputs;[8] and 35.5 and 28.5 per cent of federal and provincial sales tax revenues, respectively, were derived from intermediate inputs.

The sales tax rates applicable to machinery are reported in Table A-3. Note that the marginal effective tax rates reported later in this paper do *not* take into account sales taxes levied on intermediate inputs used in the production of capital goods. According to Kuo, McGirr and Poddar (1988), in the case of materials used in the construction of

buildings, the effective total sales tax rate was 5.5 per cent in 1980.

The Personal Tax

Households

Non-neutralities in the personal taxation of income from capital can also influence saving and investment decisions. As shown in Table A-5, the tax treatment of income from corporate investment varies depending upon the manner in which investments are financed (debt, new share issues, or retained earnings) and the tax status of the saver supplying the funds for the investment (households, tax-exempt institutions, or life insurance companies). Interest is earned on debt-financed investments, whereas investments financed by new share issues and retained earnings yield income in the form of dividends and capital gains, respectively.

In the case of households, interest is taxed at the marginal rate m. To partly compensate for the fact that dividends are paid to shareholders out of a corporation's after-tax profits, dividends received by Canadian taxpayers from taxable Canadian corporations are grossed up at the rate θ for personal tax purposes, and then a tax credit at the rate of $(\theta - 1)$ is applied. The dividend tax credit thus reduces the marginal personal tax rate on dividends from m to $\hat{m}$, where $\hat{m} = \theta m - (\theta - 1)$. In 1985, the value of θ was 1.5. This in effect meant that for every dollar of dividends actually paid out, the shareholder was deemed to have received a gross dividend of $1.50 and to have already paid taxes on that gross dividend at the rate of 33 1/3 per cent.[9]

Capital gains are only taxed upon realization. As a result of such tax deferral, the effective accrued tax (or EAT) rate on capital, z, is less than the statutory rate z_s. Moreover, in 1985 this statutory rate was, in effect, only half of a capital gains recipient's marginal tax rate because only one-half of realized capital gains were subject to tax.

The extent of the non-neutralities in the tax treatment of various types of investment income among households differs according to the income tax bracket of the investor. According to the Department of Finance's tax simulation model,[10] with the dividend tax credit and the $1,000 investment income deduction taken into account, the marginal personal tax rate on dividends for a typical shareholder, $\hat{m}_e$, was approximately 13.4 per cent in 1984, the latest year prior to tax reform for which such information was available. Hence a typical shareholder's interest income was taxed at the marginal personal rate, m_e, which was roughly 42.3 per cent.[11] With only half of realized capital gains being taxable, such income was typically taxed at the statutory rate of about 21.1 per cent. Assuming that one-tenth of accrued gains are realized in each year, the EAT ratio was about one-half.[12] Consequently, the effective accrued tax rate on capital gains for a typical shareholder, z_e, was calculated to be approximately 10.6 per cent.

Interest income from corporate bonds received by households directly or indirectly through taxed intermediaries, such as banks, typically faced a marginal personal tax rate, m_d, of about 31.8 per cent, which is less than that of a typical shareholder, m_e, because dividends are concentrated more heavily among persons in high-income brackets than is interest income. Therefore, whereas for a typical bondholder the tax rate on interest income was 31.8 per cent, that on dividends was only –2.3 per cent,[13] owing to the dividend tax credit, and the effective accrued tax rate on capital gains, z_d, was approximately 8.0 per cent.

The personal tax parameters used in our calculations are summarized in Table A-6.

Tax-Exempt Institutions

Further non-neutralities arise depending upon whether or not savings are channelled through tax-exempt institutions or life insurance companies. No personal taxes are paid on income from investments financed with households' savings held by tax-exempt institutions in the form of pension funds and registered retirement savings plans. This is precisely what would happen under a personal lifetime-income tax.[14] The present personal tax system is thus a hybrid with features of both an annual-income tax and a lifetime-income tax.[15]

Life Insurance Companies

As regards the tax treatment of income from savings through life insurance policies, one must consider the taxation of both the policyholder and the life insurance company. More than 90 per cent of all life insurance policies sold in Canada are "exempt" policies; policyholders are not taxed on income earned through such a policy unless and until it is surrendered or matures as an endowment, which means that personal taxes on this income are usually postponed for many years. As a result, investment income from contractual savings held by life insurance companies for households is estimated to be taxed at the rate $m_l = 15.9$ per cent when received by the policyholder.[16]

Life insurance companies are allowed policy reserve deductions, which ensure that any interest earned on

policyholders' funds is not taxable if it is used to fund future payments to policyholders. Our model assumes that life insurance companies earn no excess profits; all the income earned on policyholders' funds is required to fund future payments. It follows that if a life insurance company invests in corporate debt, its tax rate is zero. If, instead, it invests in shares, the policy reserve deduction is still allowed. This means that the tax system allows an implicit tax credit payable to life insurance companies for dividends and retentions.

The policy reserve deduction can be viewed as the equivalent of a dividend tax credit at the rate $(\phi - 1)$, as defined in Table A-5, so long as insurance companies are fully taxable (and dividends are non-deductible for companies distributing them). We estimate that in 1985, insurance companies' statutory rate, τ_l, was 49.7 per cent.[17] Realized capital gains are taxed at half that amount, which means that capital gains received by life insurance companies on policyholders' funds are taxed at the effective accrued rate z_l = 5.7 per cent.[18] Using policyholders' funds to invest in equity can, therefore, reduce the corporation tax that life insurance companies pay on their income from other activities. This, together with the relatively low personal tax rate assumed to apply to policyholders, means that income from equity held by life insurance companies is subsidized under the existing tax system.

Substituting the values for m_l, τ_l, and z_l into the expression in the third column of Table A-5, we find that the tax rates corresponding to interest, dividends, and capital gains received by households via life insurance companies are 15.9, –68.2, and –40.1 per cent, respectively.

Unincorporated Businesses

The tax base for unincorporated businesses is exactly the same as that of corporations. Rather than being taxed at the corporation rate, however, unincorporated business income is taxed at proprietors' personal rates. According to the Department of Finance's tax simulation model, in 1984, the marginal personal tax rates (combined federal and provincial) on unincorporated business income, n, were 40.6, 32.9, and 35.4 per cent, respectively, for manufacturing, other industry, and commerce.

Owner-Occupied Housing

Owner-occupied housing, which accounts for just over two-thirds of Canada's residential housing stock, enjoys favourable tax treatment relative to investment in the business sector. The imputed income derived from home ownership (that is, the rental value) is not subject to tax, nor are capital gains realized upon the sale of a taxpayer's principal residence. In addition, local property tax rates are lower for residential housing than for nonresidential structures. On the other hand, whereas interest payments on debt-financed investments in the business sector are tax-deductible, mortgage interest payments are not. The interest received on funds channelled through financial institutions to finance mortgages is, like any other interest income, subject to personal tax.

Recent Tax-Reform Measures

The forerunner of the current tax-reform measures was a discussion paper tabled with the 1985 federal budget.[19] The paper proposed a number of significant changes in the corporation tax. Notable among these proposals were: 1) abolition of the investment tax credit (ITC), except in a few special cases (for example, a credit would still be available for scientific research expenditures); 2) removal of the 3-per-cent inventory allowance; 3) a reduction in capital cost allowances (CCAs); and 4) a cut of 7 percentage points in the basic federal statutory corporation tax rate. Moreover, plans to phase in a $500,000 lifetime personal exemption for capital gains were announced in the budget itself.

1986 Federal Budget

Subsequent to the 1985 discussion paper and as a preliminary to the 1987 White Paper, the 1986 federal budget announced several measures intended to reduce the variation in marginal effective corporation tax rates.[20] The measures included: 1) the phasing out of the investment tax credit by 1989 except in a few special cases and designated areas; 2) immediate elimination of the inventory allowance; and 3) a gradual reduction in statutory corporation tax rates over a three-year period starting in 1987. In addition, the dividend tax credit was reduced from 50 to 33 1/3 per cent, which became effective on January 1, 1987. Furthermore, a 3-per-cent surtax was imposed on corporate and personal incomes.

1987 White Paper

Far broader measures designed to achieve a greater degree of tax neutrality are proposed in the 1987 White Paper,[21] which is to be implemented in two stages. During the first stage, the basic federal statutory corporation tax rate

was reduced from 36 to 28 per cent on July 1, 1988. The tax rate applicable to manufacturing will be gradually reduced from 30 to 23 per cent in 1991, and the small business rate reduced to 12 per cent. The special tax deduction that further reduces the corporation tax rate for small manufacturers was, however, eliminated so that the tax rate on these small businesses rose on July 1, 1988 from 8 per cent to the 12-per-cent rate proposed for small businesses generally. At the same time, the incentive embodied in capital cost allowances was curtailed. In particular, the three-year write-off previously accorded to investment in manufacturing machinery was reduced to a 25-per-cent declining balance rate. In addition, the proportion of corporate capital gains that is taxed increased from its previous level of one-half to two-thirds in 1988 and will rise to three-quarters in 1990. Moreover, a new tax will be applied to dividends from preferred shares if the earnings of the payor corporation are non-taxable. A 15-per-cent tax will be levied on investment income accruing to fund insurance liabilities of life insurance companies.

At the personal level, federal tax rates were reduced to three brackets; 17 per cent on the first $27,500 of taxable income, 26 per cent on the next $27,500, and 29 per cent on any additional taxable income. These reductions were accompanied by the elimination of a large number of exemptions and deductions, many of which were converted into tax credits. The dividend tax credit was further reduced to 25 per cent. The lifetime capital gains exemption was fixed at $100,000 except in the case of farmland and small business shares, both of which will be eligible for a $500,000 lifetime exemption. However, the proportion of an individual's capital gains that is taxed increased from the previous level of one-half to two-thirds in 1988 and will be set at three-quarters in 1990 and subsequent years.

Finally, the base of the federal manufacturers' sales tax was expanded pending its replacement with a value-added tax during the second stage of tax reform.

In the second stage of tax reform, the government proposes to replace the existing federal sales tax with a broad-based value-added tax that extends to the retail level and exempts business inputs and exports. At the same time, not only will the present corporate and personal income surtaxes be removed, but personal tax rates will be reduced even further. The new sales tax will also be accompanied by a more generous refundable tax credit to assist low-income households.

Proposals by the Economic Council of Canada

Shortly before the federal government released its White Paper on tax reform, the Economic Council of Canada published its package of proposals for reforming the taxation of capital income.[22] Although this package does not appear to be politically viable at the present time, it contained many interesting features that would affect the cost of capital and thus marginal effective tax rates.

The highlight of the Council's package was its recommendation that the personal tax be based on lifetime income. This would be accomplished by gradually relaxing the amount that individuals would be permitted to contribute to registered retirement savings plans. In addition, the Council recommended that: 1) capital gains be fully included in taxable income; 2) a $2,000 investment income deduction; 3) a 4-percentage-point cut in the top federal marginal tax rate on personal income; and 4) full indexation of personal tax brackets, deductions, and exemptions.

With respect to the corporation tax, the Council favoured structuring the tax more along the lines of a withholding tax on equity income. More specifically, the recommendations involved: 1) elimination of the investment tax credit; 2) capital cost allowances that correspond more closely to economic depreciation; 3) lower and more uniform statutory corporation tax rates; 4) closer integration of corporation and personal taxes; 5) unlimited carry-forward of losses for tax purposes – with interest; and 6) indexation of the corporation tax base.

As regards sales and property taxes, the Council recommended that business inputs be exempt from federal and provincial sales taxes and that property taxes correspond as much as possible to benefits received.

4 Estimates of Marginal Effective Tax Rates

Fixed-*p* estimates of marginal effective tax rates on income from corporate and noncorporate investments in Canada are reported in Tables 4-1 to 4-12. Corresponding estimates for the fixed-*r* case are found in Appendix B.

Corporate Sector

Principal Results (1985)

Using the capital stock, financing, and ownership weights summarized in Table A-7 of Appendix A, weighted averages of marginal effective tax rates have been computed for the same 12 broad categories of investment examined by King and Fullerton (1984). Estimates of the marginal effective tax rates associated with these types of investment in 1985 (prior to the May budget) are shown in Table 4-1, based on a 5-per-cent expected annual inflation rate. (The actual rate was in fact 4 per cent.)

The most striking feature of Table 4-1 is the enormous variation in tax rates across industries, assets, methods of

Table 4-1

Marginal Effective Tax Rates, Fixed-*p*, Corporate Sector, 1985[1]

	Total (1)	Personal (2)	Corporate (including sales and property taxes) (3)	Corporate (excluding sales and property taxes) (4)	Total (excluding sales and property taxes) (5)	Total (excluding sales taxes) (6)	Total (excluding property taxes) (7)
				(Per cent)			
Industry							
Manufacturing	32.4	24.7	10.3	3.2	26.4	30.9	27.9
Other industry	47.5	27.9	27.1	13.5	35.8	43.1	40.2
Commerce	45.6	30.0	22.3	5.9	31.9	39.0	38.5
Asset							
Machinery	29.5	25.0	6.0	–4.3	20.8	20.8	29.5
Buildings	51.6	29.2	31.6	12.0	34.9	51.6	34.9
Inventories	42.8	28.0	20.4	20.4	42.8	42.8	42.8
Method of finance							
Debt	20.0	34.0	–21.3	–37.0	8.1	15.2	12.8
New share issues	55.5	19.6	44.6	35.7	47.5	52.5	50.5
Retained earnings	53.5	15.9	44.6	36.0	45.1	50.4	48.2
Owner							
Households	47.9	34.5	20.5	9.2	38.8	44.4	42.3
Tax-exempt institutions	12.4	0.0	12.4	0.3	0.3	7.7	5.0
Insurance companies	1.4	5.4	–4.2	–18.0	–12.0	–3.9	–6.8
Overall tax rate	40.2	26.9	18.3	6.8	30.5	36.5	34.2
Tax wedge	4.0	2.2	1.8	0.7	3.1	3.7	3.4
Weighted standard deviation	27.7	19.5	37.4	38.8	28.0	29.1	27.4

1 These estimates are based on a 5-per-cent expected annual inflation rate.

finance, and owners. Column 1 shows that when sales, property, corporation, and personal taxes are all taken into account, investments in manufacturing are the most lightly taxed, and those in "other industry" are taxed the most heavily. Machinery is taxed less than inventories, which in turn are taxed much less than buildings. Investments financed by debt receive much more favourable tax treatment than do investments financed by new shares or retained earnings. Finally, investments financed by savings channelled directly from households to corporations are taxed a great deal more than investments financed by savings channelled indirectly to corporations through tax-exempt institutions or insurance companies.

As column 4 of Table 4-1 shows, the corporation tax system is responsible for most of the variation in marginal effective tax rates among assets, types of finance, and industries, even though it accounts for a relatively small proportion of the total tax wedge – that is, the difference between the before-tax and after-tax rates of return. The corporation tax wedge, exclusive of both property and sales taxes, is 0.7 percentage points, whereas the personal tax wedge is 2.2 percentage points. The wide variation in marginal effective corporation tax rates is caused largely by the investment tax credit, and accelerated capital cost allowances, both of which heavily favour machinery, by the tax-deductibility of interest payments, and incomplete integration of corporate and personal income taxes, all in combination with high statutory corporation tax rates. The fact that manufacturing industries and small businesses are subject to lower statutory corporation tax rates than non-manufacturing industries and large corporations also contributes to tax rate variance.

Although the personal tax accounts for more than one-half of the total tax wedge, our calculations indicate that it is much less important than the corporation tax as a source of variation in marginal effective tax rates (see column 2 of Table 4-1).[1] The personal tax system contributes to the variation in tax rates in two ways: by treating different forms of investment income differently and by treating different types of investors differently. But some of the features of the personal tax system that cause such differences mitigate some of the effects attributable to the corporation tax. For instance, interest income received by households is taxed upon receipt and thus partially offsets the deductibility of interest payments for corporation tax purposes. Moreover, preferences for dividend income and capital gains in the personal tax system partly make up for the lack of corporate deductions for the costs of equity finance. Thus the personal tax tends to counteract the bias in favour of debt financing in the corporation tax. The result is that the variation in marginal effective tax rates attributable to both the personal tax and the corporation tax (28.0 per cent) is substantially less than the variation attributable to the corporation tax alone (38.8 per cent).

As pointed out earlier, federal and provincial sales taxes levied on purchases of capital goods are borne entirely by machinery, with commerce and other industries being the most affected. A comparison of columns 1 and 6 in Table 4-1 reveals that sales taxes raise the marginal effective total tax rate on income from investments in machinery from 20.8 to 29.5 per cent, thereby bringing it somewhat more into line with the rates on income from investments in buildings and inventories. Hence the main effect of sales taxes is to offset partially the preferential treatment accorded to machinery by the corporation tax through accelerated depreciation allowances and the investment tax credit. When sales taxes are added to corporation, business property, and personal taxes, the variation in marginal effective tax rates, as measured by the standard deviation, drops from 29.1 to 27.7 per cent. It follows that eliminating capital expenditures from existing federal and provincial sales tax bases, or replacing sales taxes with a value-added tax that exempts capital inputs, could increase the variation in marginal effective tax rates unless the capital cost allowances now granted to machinery were reduced. (Note that no account is taken here of the fact that a consumption type VAT would also exempt intermediate inputs that are used in the production of capital goods, notably buildings.)

A comparison of columns 1 and 7 of Table 4-1 shows that municipal business property taxes increase the marginal effective tax rate on buildings relative to machinery and inventories. Again, commerce and other industries are most affected. Consequently, when business property taxes are added to corporation, sales, and personal taxes, the variation in marginal effective tax rates rises slightly, from 27.4 to 27.7 per cent.

The Impact of Inflation on Marginal Effective Tax Rates

Inflation increases marginal effective tax rates in some cases and decreases them in others. The result of these contradictory tendencies is a broadening of the range of variation in marginal effective tax rates – a result that increases the distortion of investment decisions by taxes. The tendency of inflation to increase the variation in marginal effective tax rates is especially pronounced in corporation taxation.

As inflation erodes the real value of capital cost allowances, for instance, it tends to increase marginal effective

corporation tax rates on depreciable capital such as machinery and buildings. In addition, inflation tends to increase the nominal value of inventories. Because firms must use first-in-first-out (FIFO) inventory accounting for tax purposes, the difference between the current sales price and the acquisition cost of inventories represents taxable profits. Thus inflation tends to increase nominal taxable profits and, consequently, the marginal effective corporation tax rate. As partial compensation, firms were formerly permitted an inventory allowance of 3 per cent, but this allowance was withdrawn by the February 1986 federal budget.

As an offset, inflation increases nominal interest rates and hence interest payments on corporate debt. Since interest payments are deductible from taxable income, inflation decreases corporation taxes paid on debt-financed investments. At the same time, however, inflation tends to increase nominal interest receipts, resulting in payment of higher personal taxes. The two effects are not equal, however. Averaged over all investors, the marginal personal tax rate on interest income is approximately 24.1 per cent,[2] whereas an averaging of corporation tax rates (taking into account the special rates for manufacturing and small business, as well as the different provincial rates), shows a range of 35.23 to 41.33 per cent industry by industry. And since income from equity-financed investments are taxed in nominal terms at both the corporation and personal levels, inflation increases the effective tax rates on dividends and capital gains. The end result is encouragement for investments financed by debt rather than by new share issues or retained earnings.

Marginal effective tax rates under various expected inflation rates are reported in Tables 4-2 and 4-3. The tax rates in the zero-inflation columns would obtain if the existing tax system were fully indexed.[3] As shown in Table 4-2, with inflation, marginal effective corporate tax rates on machinery and buildings decline, whereas tax rates on

Table 4-2

Marginal Effective Corporate Tax Rates, Fixed-*p*, Corporate Sector, 1985

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	13.2	10.3	8.4
Other industry	30.3	27.1	20.5
Commerce	26.5	22.3	20.9
Asset			
Machinery	9.1	6.0	0.7
Buildings	36.3	31.6	23.1
Inventories	22.1	20.4	31.5
Method of finance			
Debt	–1.6	–21.3	–40.4
New share issues	37.0	44.6	52.2
Retained earnings	37.0	44.6	52.3
Owner			
Households	22.9	20.5	18.3
Tax-exempt institutions	18.2	12.4	7.0
Insurance companies	8.5	–4.2	–16.4
Overall tax rate	21.6	18.3	15.2
Weighted standard deviation	26.1	37.4	50.3

Table 4-3

Marginal Effective Total Tax Rates, Fixed-*p*, Corporate Sector, 1985

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	27.8	32.4	37.5
Other industry	42.6	47.5	48.8
Commerce	40.5	45.6	52.6
Asset			
Machinery	24.7	29.5	32.0
Buildings	47.8	51.6	51.5
Inventories	36.2	42.8	59.7
Method of finance			
Debt	22.9	20.0	17.6
New share issues	43.5	55.5	67.5
Retained earnings	43.8	53.5	62.2
Owner			
Households	40.1	47.9	55.3
Tax-exempt institutions	18.2	12.4	7.0
Insurance companies	12.5	1.4	–9.6
Overall tax rate	35.4	40.2	44.8
Weighted standard deviation	20.4	27.7	36.2

inventories increase as inflation rises above 5 per cent.[4] Tax rates on debt-financed investment decline with inflation, while those on equity-financed investments increase. In all industries, marginal effective corporate tax rates decline as inflation rises.

Marginal effective personal tax rates tend to increase with inflation unless investments are channelled through life insurance companies or tax-exempt institutions. The former receive a slight subsidy, which rises with inflation; the latter are, of course, not subject to personal taxes. Table 4-3, which takes the corporate and personal tax systems together, shows that inflation increases marginal effective total tax rates for households, all industries, all types of assets, and all types of finance except debt. The net result is that inflation increases the overall marginal effective tax rate. For example, the rate for the corporate sector as a whole rises from 35.4 per cent with zero inflation to 44.8 per cent if inflation is expected to remain at 10 per cent.

Moreover, by increasing the marginal effective tax rate in some cases and decreasing it in others, inflation accentuates the variation in rates. Although inflation has contributed less to the variation than the investment tax credit and accelerated capital cost allowances, it should be borne in mind that one factor behind the enhancement of these incentives during the 1970s and early 1980s was a desire to counteract inflation's adverse impact on corporate cash flows.[5] Thus *ad hoc* tax-policy responses to inflation, as well as inflation itself, have contributed to the wide variation in marginal effective tax rates.

Comparison with 1980

Tables 4-4 and 4-5 show marginal effective tax rates for 1980, which can be compared with the 1985 tax rates reported in Tables 4-2 and 4-3. For purposes of comparison, the 1985 capital stock, financing, and ownership weights

Table 4-4

Marginal Effective Corporate Tax Rates, Fixed-*p*, Corporate Sector, 1980

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	13.9	10.2	8.4
Other industry	27.3	23.9	17.4
Commerce	23.4	18.4	17.4
Asset			
Machinery	5.0	1.0	–5.2
Buildings	35.3	30.3	21.4
Inventories	23.1	20.7	32.2
Method of finance			
Debt	–4.8	–26.0	–45.3
New share issues	36.6	44.0	52.3
Retained earnings	36.6	44.0	52.3
Owner			
Households	21.4	18.4	16.5
Tax-exempt institutions	16.4	9.8	4.6
Insurance companies	5.9	–7.8	–20.0
Overall tax rate	20.0	16.0	13.2
Weighted standard deviation	26.9	39.1	53.0

Table 4-5

Marginal Effective Total Tax Rates, Fixed-*p*, Corporate Sector, 1980

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	27.6	31.2	35.9
Other industry	39.3	43.3	44.1
Commerce	37.1	40.8	47.5
Asset			
Machinery	20.4	23.7	24.9
Buildings	46.3	49.2	48.2
Inventories	36.3	41.6	58.6
Method of finance			
Debt	18.3	12.8	8.8
New share issues	43.1	54.9	67.5
Retained earnings	43.4	52.8	62.2
Owner			
Households	38.0	44.6	51.6
Tax-exempt institutions	16.4	9.8	4.6
Insurance companies	8.8	–4.1	–16.0
Overall tax rate	33.3	37.0	41.3
Weighted standard deviation	21.3	29.4	38.9

were also used to calculate the 1980 tax rates so that any changes in tax rates since 1980 are the result of changes in the tax system rather than changes in the pattern of investment. A comparison of Tables 4-2 and 4-3 with Tables 4-4 and 4-5 reveals that while the pattern of tax rates changed very little between 1980 and 1985, there was a trend towards higher taxation of income from corporate investment.

The Impact of Tax Reform

The impacts on marginal effective total tax rates of the 1986 federal budget and of the proposals contained in the 1987 White Paper are shown in Table 4-6. The corresponding impacts of tax reform on marginal effective corporate tax rates are reported in Table 4-7.

Column 2 of Table 4-6 captures the combined effect of the main changes announced in the 1986 budget (as summarized in Chapter 3, 1986 Federal Budget), had they been fully implemented. These estimates also take into account the $500,000 lifetime capital gains exemption proposed in the 1985 budget.[6] Judging by the weighted standard deviation, the outcome would be a substantial reduction in the dispersion in tax rates, and therefore greater tax neutrality. The overall marginal effective total tax rate on corporate investment would remain unchanged.

Column 3 shows the pattern of marginal effective total tax rates for the first stage of the 1987 White Paper (see Chapter 3, 1987 White Paper) which were simulated on top of the 1986 budget package. Again the outcome would be less variance in tax rates. However, there would also be a

Table 4-6

Marginal Effective Total Tax Rates before and after Tax Reform, Fixed-*p*, Corporate Sector[1]

	1985 (1)	1986 budget package[2] (2)	1987 White Paper stage one (3)	White Paper stage two (national VAT) (4)	White Paper stage two (federal VAT) (5)
			(Per cent)		
Industry					
Manufacturing	32.4	34.3	41.1	39.8	40.2
Other industry	47.5	44.3	47.2	42.8	44.9
Commerce	45.6	45.7	48.2	41.7	45.2
Asset					
Machinery	29.5	29.6	37.5	29.3	33.3
Buildings	51.6	49.1	52.1	52.1	52.1
Inventories	42.8	47.0	47.2	47.2	47.2
Method of finance					
Debt	20.0	28.0	33.0	28.8	30.9
New share issues	55.5	65.6	68.7	66.2	67.4
Retained earnings	53.5	45.6	50.0	46.7	48.3
Owner					
Households	47.9	46.1	50.6	47.2	48.8
Tax-exempt institutions	12.4	18.5	21.3	16.9	19.0
Insurance companies	1.4	10.9	26.7	22.3	24.4
Overall tax rate	40.2	40.2	44.7	41.2	42.9
Weighted standard deviation	27.7	22.5	19.5	21.1	20.2

1 These estimates are based on a 5-per-cent expected annual inflation rate.
2 Includes $500,000 personal lifetime capital gains exemption.

much more significant increase in the overall taxation of marginal investment in the corporate sector, which would tend to discourage such investment.

The main feature of the second stage of the 1987 White Paper entails the implementation of a broad-based sales tax similar to a value-added tax (VAT).[7] One of the principal advantages of such a VAT is that, unlike the federal manufacturers' sales tax and current provincial sales taxes, capital goods and other intermediate inputs would be exempt. However, since the burden of existing federal and provincial sales taxes levied on purchases of capital goods is borne entirely by machinery, such taxes tend to offset the corporation tax system's bias in favour of investments in machinery that is attributable to accelerated CCAs. It follows, therefore, that replacement of the existing sales taxes with a VAT would increase the dispersion in marginal effective tax rates, as shown in column (4) of Table 4-6. Hence, unless further steps were taken to reduce the generosity of CCAs permitted by the corporation tax, Stage Two of the White Paper could undo some of the tax neutrality accomplished in Stage One. Not surprisingly, removal of sales taxes on purchases of capital goods would reduce the overall taxation of capital income.

Overall, the tax-reform measures envisaged in the 1987 White Paper would narrow the dispersion in tax rates only slightly. Some important discrepancies would remain. Capital cost allowances would still be more generous for investments in machinery than for those in buildings, and the latter would continue to bear the brunt of municipal business property taxes. New investments financed by debt would continue to be taxed less heavily than those financed by equity, and whereas in 1985 investments financed by

Table 4-7

Marginal Effective Corporate Tax Rates before and after Tax Reform, Fixed-*p*, Corporate Sector[1]

	1985 (1)	1986 budget package (2)	1987 White Paper stage one (3)	White Paper stage two (national VAT) (4)	White Paper stage two (federal VAT) (5)
			(Per cent)		
Industry					
Manufacturing	10.3	18.3	23.5	22.0	22.4
Other industry	27.1	28.8	29.8	24.7	27.2
Commerce	22.3	26.8	28.1	20.4	24.6
Asset					
Machinery	6.0	11.7	18.4	8.8	13.4
Buildings	31.6	33.8	35.2	35.2	35.2
Inventories	20.4	30.4	28.6	28.6	28.6
Method of finance					
Debt	–21.3	–10.7	–2.4	–8.0	–5.2
New share issues	44.6	46.2	45.7	42.4	44.0
Retained earnings	44.6	46.2	45.7	42.4	44.0
Owner					
Households	20.5	25.4	27.4	23.3	25.3
Tax-exempt institutions	12.4	18.5	21.3	16.9	19.0
Insurance companies	–4.2	4.1	32.1	27.9	29.9
Overall tax rate	18.3	23.5	26.5	22.3	24.3
Weighted standard deviation	37.4	31.9	26.6	28.5	27.4

1 These estimates are based on a 5-per-cent expected annual inflation rate.

new share issues and retained earnings were taxed at roughly the same rate, after tax reform investments financed by new share issues would be taxed more heavily than those financed by retentions. Moreover, firms would still face different federal corporation tax rates, depending on their size and the nature of their production activities. Consequently, after tax reform new investment in manufacturing would continue to be taxed less heavily than that in commerce and other industries.

Finally, if the measures contained in the 1987 White Paper were implemented, the tax system would remain extremely susceptible to inflation, albeit to a lesser extent than in 1985. As shown in Tables 4-8 and 4-9, the dispersion in marginal effective tax rates would still increase substantially with inflation. At the same time, the changes in the taxation of investment income announced in the 1986 budget and the 1987 White Paper would have a number of additional drawbacks. The overall impact will be to increase the marginal effective tax rate applicable to the corporate sector as a whole, which would tend to discourage new investment. Furthermore, the corporate and personal income tax systems will be less integrated after tax reform than before.[8]

The Noncorporate Business Sector

Fixed-*p* calculations of marginal effective tax rates for noncorporate business investments are reported in Table 4-10. These tax rates are computed for the same broad categories of asset and industry examined in the corporate sector. The capital stock weights and debt/equity ratios used

Table 4-8

Marginal Effective Total Tax Rates after Tax Reform,[1] Fixed-*p*, Corporate Sector

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	31.9	39.8	45.7
Other industry	37.7	42.8	45.2
Commerce	33.1	41.7	49.1
Asset			
Machinery	23.2	29.3	33.3
Buildings	47.9	52.1	53.3
Inventories	31.8	47.2	62.5
Method of finance			
Debt	25.8	28.8	29.9
New share issues	48.7	66.2	82.3
Retained earnings	37.6	46.7	53.7
Owner			
Households	37.6	47.2	54.9
Tax-exempt institutions	18.6	16.9	13.1
Insurance companies	22.7	22.3	19.3
Overall tax rate	33.8	41.2	46.5
Weighted standard deviation	15.9	21.1	28.0

1 Assumes a national VAT.

Table 4-9

Marginal Effective Corporate Tax Rates after Tax Reform,[1] Fixed-*p*, Corporate Sector

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	20.4	22.0	21.5
Other industry	26.7	24.7	20.0
Commerce	19.5	20.4	20.0
Asset			
Machinery	9.7	8.8	5.7
Buildings	38.4	35.1	28.7
Inventories	19.1	28.6	38.1
Method of finance			
Debt	3.3	–8.0	–21.8
New share issues	34.2	42.4	48.8
Retained earnings	34.2	42.4	48.9
Owner			
Households	22.5	23.3	22.0
Tax-exempt institutions	18.6	16.9	13.1
Insurance companies	25.3	27.9	28.6
Overall tax rate	21.9	22.3	20.7
Weighted standard deviation	20.5	28.5	38.6

1 Assumes a national VAT.

are identical to those used for the corporate sector because it was not possible to obtain separate data for each of the two sectors. In any case, use of the same capital stock weights and debt/equity ratios enables us to compare the tax treatment of corporate and noncorporate business investment. Needless to say, the only form of equity finance available to unincorporated businesses other than debt is proprietors' equity. It is assumed that neither tax-exempt institutions nor insurance companies invest in unincorporated businesses.

The pattern of marginal effective tax rates among industries and assets in the noncorporate business sector was very similar to that found in the corporate sector. However, although investments financed by debt were again taxed less than those financed by equity, the difference was much smaller than that found in the corporate sector. As a result, the dispersion in marginal effective tax rates was much smaller than that existing in the corporate sector and is also much less sensitive to inflation. Finally, the overall marginal effective tax rate faced by unincorporated business was a few percentage points below that applied to corporations.

Table 4-10

Marginal Effective Total Tax Rates, Fixed-*p*, Noncorporate Sector, 1985

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	25.5	30.6	36.6
Other industry	37.6	43.0	46.6
Commerce	38.8	45.3	54.1
Asset			
Machinery	21.7	27.4	31.5
Buildings	44.0	48.4	50.3
Inventories	35.2	42.6	60.1
Method of finance			
Debt	30.0	33.7	38.0
Proprietors' equity	34.1	40.9	48.2
Owner			
Households	32.4	38.0	44.1
Overall tax rate	32.4	38.0	44.1
Weighted standard deviation	13.9	14.8	17.4

The changes in the taxation of investment income envisaged in the 1986 budget and the 1987 White Paper will have an impact on the noncorporate business sector similar to that found for the corporate sector. A comparison of Tables 4-10 and 4-11 show that the dispersion in marginal effective tax rates will be much lower and the overall tax rate higher after tax reform. The increase in the overall tax rate faced by unincorporated business investment will be, however, substantially greater than the increase faced by corporate investment, so that whereas before tax reform, unincorporated business investment was taxed slightly less than corporate investment, the opposite situation will arise after tax reform.

Owner-Occupied Housing

Marginal effective tax rates for investment in owner-occupied housing are reported in Table 4-12, taking into account residential property tax rate of 1.07 per cent in 1980, and 1.23 per cent in 1985, and assuming that the

Table 4-11

Marginal Effective Total Tax Rates after Tax Reform,[1] Fixed-*p*, Noncorporate Sector

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	33.0	41.2	47.6
Other industry	40.1	45.6	49.1
Commerce	39.5	49.6	58.4
Asset			
Machinery	30.6	37.2	42.1
Buildings	46.3	50.9	52.9
Inventories	33.2	49.7	66.3
Method of finance			
Debt	35.9	43.2	48.9
Proprietors' equity	37.3	45.6	52.4
Owner			
Households	36.7	44.7	51.0
Overall tax rate	36.7	44.7	51.0
Weighted standard deviation	8.9	8.9	11.4

1 Assumes a national VAT.

Table 4-12

Marginal Effective Tax Rates for Owner-Occupied Housing, Fixed-*p*

	Expected inflation rate		
	0	5	10
	(Per cent)		
1980	12.9	14.2	15.4
1985	14.7	16.1	17.4
After tax reform	14.7	16.1	17.4

marginal personal tax rate on mortgage interest receipts is the same as the tax rate on interest income used in computing marginal effective tax rates for the corporate and noncorporate business sectors. The marginal effective tax rates for owner-occupied housing reflect the fact that in 1984 88.4 per cent of the housing stock was financed with owners' equity and the remaining 11.6 per cent was financed by mortgages of which households, tax-exempt institutions, insurance companies, held 69.8, 21.3 and 8.9 per cent, respectively. (The latter proportions are based on 1981 data.)[9]

As shown in Table 4-12, for any given expected inflation rate, the marginal effective tax rate on owner-occupied housing rose by almost 2 percentage points between 1980 and 1985. This increase was mainly due to the rise in the residential property tax rate. According to our calculations, neither the tax changes contained in the 1986 federal budget nor the 1987 White Paper would have much, if any, effect on the taxation of owner-occupied housing. Since our calculations show that the overall tax rate on marginal investment in both the corporate and noncorporate business sectors would increase as a consequence of tax reform, it follows that new investment in housing will be encouraged relative to that in businesses once the proposals envisaged in the 1987 White Paper are enacted.

5 International Comparisons[1]

Estimates for 1985

Fixed-*p* estimates of marginal effective tax rates are reported in Tables 5-1 to 5-4 for corporate sector investments in the United States, the United Kingdom, and Japan as well as for Canada.[2] As pointed out in Chapter 2, the marginal effective *total* tax rates reported in Tables 5-1 and 5-3 indicate the pattern of investment incentives provided by the tax system in each country if investments are financed by domestic saving. On the other hand, if capital is internationally mobile so that the cost of financing investments is determined on world capital markets, then the marginal effective *corporate* tax rates reported in Tables 5-2 and 5-4 reflect more accurately the investment incentives provided by the tax systems in each of the four countries.

The expected annual inflation rate is assumed to be 5 per cent, which is close to the level currently prevailing in Canada, the United States, and the United Kingdom. In the case of Japan, marginal effective tax rates are also computed assuming zero expected inflation since such a rate is more in line with that country's most recent experience.

Tables 5-1 and 5-2 reveal a number of notable differences in the pattern of marginal effective tax rates between the four countries in 1985. In contrast to the situation in Japan, the tax systems of Canada, the United Kingdom, and especially of the United States favoured new investments in machinery compared to buildings and inventories.[3] As far as industries are concerned, Canada and to a lesser extent the United Kingdom, treated investments in manufacturing more favourably than those in commerce and in other industry, whereas the United States and Japan did not. Both of the foregoing findings with respect to Japan are interesting because they cast doubt on the widespread presumption

Table 5-1

International Comparisons of Marginal Effective Tax Rates, Fixed-*p* Case, 1985

	Canada	United States	United Kingdom	Japan	Japan (zero inflation)
			(Per cent)		
Industry					
Manufacturing	32.4	43.2	15.6	23.8	30.2
Other industry	47.5	7.6	18.3	10.4	24.0
Commerce	45.6	29.2	47.2	23.4	35.0
Asset					
Machinery	29.5	4.6	–7.9	18.9	23.0
Buildings	51.6	31.4	48.0	18.4	27.2
Inventories	42.8	45.1	62.9	23.0	39.6
Method of finance					
Debt	20.0	–21.2	–12.2	–28.6	2.9
New share issues	55.5	74.6	17.9	72.2	57.6
Retained earnings	53.5	52.4	34.6	60.8	51.9
Owner					
Households	47.9	44.2	21.3	9.9	23.8
Tax-exempt institutions	12.4	–15.7	22.1	15.1	26.6
Insurance companies	1.4	16.0	42.3	70.0	57.8
Overall tax rate	40.2	28.6	24.8	20.1	29.6

Table 5-2

International Comparisons of Marginal Effective Corporate Tax Rates, Fixed-*p* Case, 1985

	Canada	United States	United Kingdom	Japan	Japan (zero inflation)
			(Per cent)		
Industry					
Manufacturing	10.3	27.5	5.9	13.6	24.6
Other industry	27.1	–16.6	8.7	–3.7	16.3
Commerce	22.3	9.2	39.6	12.6	29.4
Asset					
Machinery	6.0	–18.5	–19.5	7.3	16.3
Buildings	31.6	12.2	40.5	6.8	20.8
Inventories	20.4	28.7	56.5	11.9	34.2
Method of finance					
Debt	–21.3	–55.4	–53.3	–51.8	–9.7
New share issues	44.6	43.0	–10.8	57.7	49.7
Retained earnings	44.6	42.1	34.6	60.7	51.9
Owner					
Households	20.5	9.5	2.5	–4.2	16.2
Tax-exempt institutions	12.4	2.5	22.1	15.1	26.6
Insurance companies	–4.2	25.1	42.3	70.0	57.8
Overall tax rate	18.3	9.2	15.6	8.7	23.4

held in Canada that preferential tax treatment of investment in manufacturing and in machinery is necessary to ensure this country's international competitiveness. Japan's economic performance has been outstanding in the absence of such tax preferences.

In all four countries, investments financed by debt were taxed less than those financed by equity, with the discrepancy being far greater in Japan and in the United States than in Canada and the United Kingdom. The low and even negative marginal effective *total* tax rates in the United States and Japan were due to the fact that interest payments were deductible at statutory corporation tax rates that were much higher than the personal rates applicable to interest receipts.[4] Marginal effective *corporate* tax rates reveal that at the corporate level, investments financed by new share issues and retained earnings were taxed at roughly the same rates in Canada and in the United States. By contrast, in Japan where the statutory corporation tax rate on distributed profits was less than that on retentions, the marginal effective corporate tax rate on investments financed by new share issues was less than the rate on investments financed by retained earnings. In the United Kingdom, where the corporation tax is based on an imputation system involving a combination of Advance Corporation Tax (ACT) and a dividend tax credit, marginal investments financed by new share issues are effectively subsidized relative to marginal investments financed by retained earnings.[5] Marginal effective *total* tax rates show, however, that when personal as well as corporate taxes are taken into account, in Canada investments financed by new share issues and retained earnings were taxed at similar rates. In contrast, in the United States and in Japan, investments financed by new share issues were taxed more heavily than those financed by retained earnings, while the opposite was true in the United Kingdom.

Furthermore, whereas in Canada and in the United States the marginal effective tax rates applicable to new investments financed by households (either directly or through banks) were much higher than those applicable to new investments financed by tax-exempt institutions or by insurance companies, in Japan and to a lesser degree the United Kingdom, investments financed by households (either directly or through banks) were taxed less than those

Table 5-3

International Comparisons of Marginal Effective Tax Rates after Tax Reform, Fixed-*p* Case

	Canada[1]	United States[2]	United Kingdom[3]	Japan	Japan (zero inflation)
			(Per cent)		
Industry					
Manufacturing	39.8	49.8	42.6	34.9	35.3
Other industry	42.8	31.0	38.7	24.3	30.0
Commerce	41.7	39.6	51.7	34.9	39.3
Asset					
Machinery	29.3	36.6	25.5	30.5	29.2
Buildings	52.1	42.5	66.3	30.8	32.9
Inventories	47.2	43.3	53.8	34.9	43.0
Method of finance					
Debt	28.8	9.0	31.6	–6.3	12.4
New share issues	66.2	69.3	29.0	78.6	60.0
Retained earnings	46.7	56.9	48.9	63.6	53.2
Owner					
Households	47.2	52.0	48.6	25.0	30.7
Tax-exempt institutions	16.9	9.8	37.2	15.9	24.9
Insurance companies	22.3	36.2	49.4	68.7	55.9
Overall tax rate	41.2	41.4	44.7	32.0	34.7

1 1990, assuming a national value-added tax.
2 1986.
3 1988/89.

financed by savings channelled through tax-exempt institutions and insurance companies.

The Impact of Recent Tax-Reform Measures

The United States is widely perceived as having set the pace in the current wave of tax reform with the *Tax Reform Act* of 1986, even though it followed major reforms in the United Kingdom in 1984 and those in Canada begun earlier in 1986. Tax reform in Japan is still in the process of implementation; so far only minor changes had been made and there remains considerable uncertainty as to the precise nature of future measures. Interestingly, the approaches to tax reform in the United States, the United Kingdom, Canada, and Japan are similar in many respects.[6]

As far as corporation taxes are concerned, like Canada, the United States and the United Kingdom have all introduced measures designed to broaden the tax base. Whereas in Canada the investment tax credit is to be phased out by 1989 except in a few special cases, the United States has eliminated investment tax credits altogether. In addition, both countries have changed depreciation schedules so that they correspond more closely to economic depreciation. In 1984 the United Kingdom started phasing out the 100-per-cent and the 75-per-cent first-year write-offs for machinery and buildings, respectively. Japan's proposals for reform call for periodic review of the useful lives of depreciable assets. As a consequence of such base-broadening measures, statutory corporation tax rates have been lowered from 46 to 34 per cent in the United States and from 52 to 35 per cent in the United Kingdom. As pointed out earlier, the basic federal statutory corporation tax rate in Canada is being reduced from 36 to 28 per cent in 1988. In Japan there has been only a small drop in statutory corporation tax rates.

At the personal level, there has also been a tendency to broaden the tax base through the reduction or elimination of exemptions and deductions, many of them pertaining to

Table 5-4

International Comparisons of Marginal Effective Corporate Tax Rates after Tax Reform, Fixed-*p* Case

	Canada[1]	United States[2]	United Kingdom[3]	Japan	Japan (zero inflation)
			(Per cent)		
Industry					
Manufacturing	22.0	34.0	31.1	15.4	23.5
Other industry	24.7	11.7	26.7	0.0	15.9
Commerce	20.4	21.8	41.4	14.7	27.8
Asset					
Machinery	8.8	18.5	11.9	9.3	15.9
Buildings	35.2	25.3	57.7	9.6	20.2
Inventories	28.6	26.4	43.5	14.4	32.0
Method of finance					
Debt	–8.0	–14.7	–6.0	–41.7	–7.4
New share issues	42.4	44.1	12.1	63.7	51.7
Retained earnings	42.4	43.7	44.6	55.5	47.6
Owner					
Households	23.3	23.6	25.6	–10.3	15.4
Tax-exempt institutions	16.9	19.3	37.2	15.9	24.9
Insurance companies	27.9	40.9	49.4	68.7	55.9
Overall tax rate	22.3	24.0	33.4	11.0	22.4

1 1990, assuming a national value-added tax.
2 1986.
3 1988/89.

capital income, with the result that all four countries have flattened their personal tax schedules. In particular, the United States' *Tax Reform Act* removed any preferential tax treatment of capital gains and instead treats all capital gains as ordinary income. In Japan, where interest income is taxed at a much lower rate than ordinary income and capital gains from equities are not taxed at all, under the new proposals most interest income would be taxed at the rate of 20 per cent and it is likely that all realized capital gains would be taxed at a similar rate.[7] In the United Kingdom, the 1988 budget reduced the number of personal income tax rates from six (ranging from a basic rate of 27 per cent to a top rate of 60 per cent) to two (25 and 40 per cent). Other major changes in the budget included the charging of capital gains tax (CGT) at income tax rates, and the abolition of any capital gains tax on pre-1982 gains.

With regard to integration of corporate and personal income taxes, the United States continues to operate a classical corporation tax system. Japan currently uses a split rate corporation tax that applies a lower rate to distributed dividends than to retained earnings, but it proposes to eliminate the lower tax rate on distributions, which means that it too would have a classical corporation tax system. The United Kingdom, like Canada, has maintained the tax credit method of relieving taxpayers of some of the personal taxes that would otherwise be paid on dividends. In both countries, however, the credit has been reduced. But whereas in Canada the dividend tax credit has been reduced in line with cuts in corporation tax rates, in the United Kingdom reductions in the tax credit have reflected cuts in the basic personal tax rate.

The impact of tax reform on the pattern and level of marginal effective tax rates in Canada, the United States, the United Kingdom, and Japan is summarized in Tables 5-3 and 5-4. Comparison with Tables 5-1 and 5-2 reveals that in all four countries tax reform will render the tax system more neutral with respect to corporate investment decisions by reducing the dispersion in marginal effective tax rates. Greater tax neutrality should improve the productivity of capital in the corporate sector by reducing the extent to

which new investment is diverted from its most productive uses, that is, those with the highest rates of return before taxes, into activities that are less productive but yield greater after-tax returns because of the preferential tax treatment they enjoy.

At the same time, however, as indicated by the overall marginal effective tax rates for each country, the taxation of income from new investment increases as a result of tax reform, albeit to a lesser degree in Canada than in the other three countries.[8] (The overall marginal effective *corporate* tax rate declines slightly in Japan after tax reform with a zero expected annual inflation rate.) Unfortunately, higher taxation of income from new investment constitutes a disincentive to capital formation. The overall tax rate on new investment in Japan would nevertheless be considerably below the corresponding rates in Canada, the United States, and the United Kingdom. Finally, it is perhaps worth noting that whereas in Canada, the United States, and the United Kingdom, tax reform increases the marginal effective *corporate* tax rate relative to the marginal effective *personal* rate, the reverse is true in Japan.

6 Conclusions and Policy Implications

Much of the present muddle associated with the taxation of investment income derives from the absence of any clear view of what principles do or should underlie it. The existing tax system involves a variety of different taxes, each with its own rules for determining tax liability. Separate taxes are levied on income, consumption, wealth, and economic rents. To be specific, corporation and personal taxes are ostensibly income-based, whereas sales taxes fall mainly on consumption. Property taxes may be viewed as a tax on a particular type of wealth, whereas resource taxes are supposedly levied on economic rent (the difference between the cost of extracting the resource and its value on world markets). Because the interaction among these taxes is difficult to comprehend, it is rarely brought out into the open when tax changes are discussed. In addition, the various exclusions and deductions embodied in the different taxes result in many inconsistencies. Furthermore, there appears to be a lack of consistency in the principles underlying both recent and proposed changes in the tax system. For instance, the base-broadening measures pertaining to the corporation tax contained in the 1986 federal budget and the 1987 White Paper are consistent with a tax system based on annual income. On the other hand, the planned relaxation of limits on RRSP contributions and the lifetime capital gains exemption, together with proposals for a federal multistage sales tax, constitute moves in the direction of a system based on lifetime income and expenditures.

The only prospect for a fair and efficient tax system is to adopt one that is based on a small set of clear and consistent principles and that departs from them only in a limited number of clearly defined ways. The alternative to this course is to devise particular rules for each situation as it arises – the approach that was taken, for example, when the rate of inflation accelerated during the 1970s. Since we cannot anticipate all possible situations or even fully appreciate the consequences of our last decision, these rules tend to proliferate and to persist even when the reasons for their introduction no longer exist.

Although the package of measures contained in the 1986 federal budget and the 1987 White Paper will in some respects result in a more neutral tax treatment of investment and saving, a number of important non-neutralities will remain. Indeed, some non-neutralities will be exacerbated by tax reform.

More specifically, firms will still be able to write off certain assets for tax purposes long before the end of their economic lives, and companies' federal statutory tax rates will still vary depending on the size and the nature of their production activities. Moreover, the continuing double taxation of equity income owing to the incomplete integration of personal and corporate income taxes means that the tax system would still be biased against equity-financed investments. The tax system would also continue to discriminate against savings supplied by households directly or indirectly through taxed intermediaries and in favour of savings channelled through pension funds, RRSPs, and life insurance companies, albeit to a lesser extent than previously. In addition, new investment in housing will be further encouraged relative to that in corporate and noncorporate businesses. As a consequence, marginal effective tax rates will continue to vary widely depending on the type of asset acquired, the industry in which the investment is made, the manner in which the investment is financed, the tax status of the saver supplying the funds, and depending on whether the investment is made in the business sector or in housing.

It is also noteworthy that the upward movement in marginal effective tax rates since 1985 as a result of tax reform will increase the disincentive to saving and to new investment in the economy as a whole, even though Canada continues to be heavily dependent on foreign saving to finance new investment, and despite the fact that new investment is an essential ingredient in the considerable economic restructuring that will be required in the wake of the new Canada-U.S. Free-Trade Agreement.

Finally, since the tax system will not be indexed, it will remain extremely susceptible to inflation. Hence, a resurgence in inflation could undo much, if not all, of the neutrality gains achieved as a result of the implementation of measures contained in the 1986 federal budget and the 1987 White Paper, and leave the way open for the same kind of *ad hoc* response that accentuated, rather than mitigated, the increased variation in marginal effective tax rates caused directly by inflation during the 1970s and early 1980s. Any repetition of past mistakes in this regard could be avoided through the indexation of the tax system. Indexation ought to be viewed as a worthwhile insurance policy against the damaging ramifications of a renewed outbreak of inflation.

Our overall conclusion, therefore, is that the tax system will still constitute a serious potential source of distortions in investment and saving decisions, even after tax reform.

Some Alternative Approaches to Tax Reform

One way in which the tax system could achieve a much higher degree of neutrality would be if it adhered more strictly to the principle of income taxation. The introduction of the following measures would accomplish this result:

- capital cost allowances that reflect, as much as possible, true economic depreciation at current replacement cost;
- indexed inventory cost accounting;
- full taxation of real capital income (including capital gains) and complete indexation of exemptions, deductions, and tax brackets at the personal level;
- deductibility of real rather than nominal interest;
- lower and more uniform statutory corporation tax rates; and
- complete integration of the corporate and personal income tax system, at least as far as dividends are concerned.

The first four measures would amount to full indexation of corporation and personal taxes on investment income, so that neither the corporation nor the personal tax structure would be sensitive to inflation.[1]

Unfortunately, implementation of a truly income-based tax system would encounter a number of practical difficulties since "income" is not an easy concept to define precisely or to measure objectively, especially on an annual basis. In particular, true economic depreciation is extremely difficult, if not impossible, to measure accurately. At the personal level, moreover, a truly comprehensive annual income tax would require the full taxation of capital gains on an accrual basis, the taxation of imputed rent on owner-occupied housing, and the taxation of imputed returns on pension funds – measures that are clearly impracticable. Hence serious divergencies from tax neutrality are inevitable as long as direct taxes are based on the concept of income.

The most desirable tax system, from a neutrality standpoint, would be one that consisted of a corporate cash-flow tax, under which all investment outlays could be immediately expensed ("free" depreciation) and interest payments would not be deductible,[2] and a personal cash-flow tax, under which saving would be deductible. A tax system of this kind has been advocated by the report of the Meade committee in the United Kingdom and explored by the Economic Council of Canada.[3]

The combination of personal and corporate cash-flow taxes described by the Economic Council of Canada would reduce both corporation and personal marginal effective tax rates on capital income to zero and thus eliminate the dispersion in tax rates caused by the existing corporation and personal tax systems.[4] The combination would therefore also eliminate the double taxation of savings associated with the current income tax system, with the result that the choice between present consumption and saving for future consumption would no longer be distorted.[5] Moreover, if personal and corporation taxes were tied to cash flows, the tax system would no longer be sensitive to inflation, so there would be no need to index the tax base. In addition, the abandonment of the income concept and the adoption of a tax base that was closely related to identifiable and measurable cash flows would curtail many of the avoidance opportunities intrinsic to an income tax and eliminate much of the complexity of the existing tax rules – a complexity that arises from the inherent difficulty of applying an income concept. Consequently, cash-flow taxes would be more equitable than the present system, or indeed the one proposed by the White Paper.[6]

Appendixes

Appendix A

Table A-1

Real After-Tax Return to Investor, s

	Type of investor		
	Household	Tax-exempt institution	Life insurance company
Method of finance			
Debt	$i(1-m)-\pi$	$i-\pi$	$i-\pi$
New shares	$\rho\theta(1-m)-\pi$	$\rho-\pi$	$\rho/(1-\tau_l)-\pi$
Retained earnings	$\rho(1-z)-\pi$	$\rho-\pi$	$\rho(1-z_l)/(1-\tau_l)-\pi$

m = household's marginal personal tax rate on investment income.
i = nominal interest rate.
π = expected inflation rate.
ρ = rate of return net of corporation taxes.
θ = opportunity cost of retained earnings in terms of gross dividends forgone.
τ = statutory corporation tax rate.
τ_l = life insurance company's statutory tax rate.
z = household's effective accrued tax rate on capital gains.
z_l = life insurance company's effective accrued tax rate on capital gains.

Table A-2

A Firm's Discount Rate, ρ

	Type of investor		
	Household	Tax-exempt institution	Life insurance company
Method of finance			
Debt	$i(1-\tau)$	$i(1-\tau)$	$i(1-\tau)$
New shares	i/θ	i	$i(1-\tau_l)$
Retained earnings	$i(1-m)/(1-z)$	i	$i(1-\tau_l)/(1-z_l)$

i = nominal interest rate.
τ = statutory corporation tax rate.
τ_l = insurance company's statutory tax rate.
θ = opportunity cost of retained earnings in terms of gross dividends forgone.
m = household's marginal personal tax rate on interest income.
z = household's effective accrued tax rate on capital gains.
z_l = life insurance company's effective accrued tax rate on capital gains.

Table A-3

Specific Tax and Inventory Parameters Used in the Calculations for Canada

	1980	1985	1986 federal budget	1987 White Paper
τ (Corporation tax rate)				
Manufacturing	0.4320	0.4133	0.3765	0.3458
Other industry	0.3964	0.4033	0.3760	0.3389
Commerce	0.3690	0.3523	0.3260	0.2975
τ_I (Insurance companies' tax rate)	0.4959	0.4973	0.4673	0.4173
θ (Opportunity cost of retained earnings in terms of gross dividends forgone)	1.5	1.5	1.33	1.25
n (Personal tax rate on noncorporate business income)				
Manufacturing	0.406	0.406	0.406	0.357
Other industry	0.329	0.329	0.329	0.315
Commerce	0.345	0.345	0.345	0.328
v (Proportion of inventories taxed under FIFO)	1.0	1.0	1.0	1.0
Corporate wealth tax rates (w_c)[1]				
Machinery				
Manufacturing	0.0000	0.000	0.0000	0.0000
Other industry	0.0000	0.000	0.0000	0.0000
Commerce	0.0000	0.000	0.0000	0.0000
Buildings				
Manufacturing	0.0227	0.0227	0.0227	0.0227
Other industry	0.0177	0.0184	0.0184	0.0184
Commerce	0.0290	0.0351	0.0351	0.0351
Inventories				
Manufacturing	0.0000	0.0000	0.0000	0.000
Other industry	0.0000	0.0000	0.0000	0.000
Commerce	0.0000	0.0000	0.0000	0.000
Sales tax rate (h)				
Machinery				
Manufacturing	0.01745	0.01874	0.01874	0.000
Other industry	0.07127	0.08011	0.08011	0.000
Commerce	0.10709	0.11697	0.11697	0.000
Buildings				
Manufacturing	0.000	0.000	0.000	0.000
Other industry	0.000	0.000	0.000	0.000
Commerce	0.000	0.000	0.000	0.000
Inventories				
Manufacturing	0.000	0.000	0.000	0.000
Other industry	0.000	0.000	0.000	0.000
Commerce	0.000	0.000	0.000	0.000

1 In the case of Canada, this is the business property tax rate.

Table A-4

Parameters for Each Asset, by Industry

	1980			1985			1986 federal budget			1987 White Paper		
	Manufacturing	Other industry	Commerce	Manufacturing	Other industry	Commerce	Manufacturing	Other industry	Commerce	Manufacturing	Other industry	Commerce
Depreciation rates (δ)												
Machinery	0.0851	0.0922	0.1242	0.0851	0.0922	0.1242	0.0851	0.0922	0.1242	0.0851	0.0901	0.1242
Buildings	0.0445	0.0383	0.0398	0.0445	0.0383	0.0398	0.0445	0.0383	0.0398	0.0445	0.0383	0.0398
Invetories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Proportion with immediate depreciation (f_2)												
Machinery	0.0409	0.0060	0.0113	0.0348	0.0053	0.0099	0.0348	0.0053	0.0099	0.0348	0.0053	0.0099
Buildings	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Inventories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Proportion with later depreciation (f_1)												
Machinery	0.9591	0.9940	0.9887	0.9652	0.9947	0.9901	0.9652	0.9947	0.9901	0.9652	0.9947	0.9901
Buildings	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Inventories	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Proportion with investment grants (f_3)												
Machinery	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Buildings	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Inventories	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Rate of investment grant (g)												
Machinery	0.0467	0.0199	0.0140	0.0572	0.0123	0.0071	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Buildings	0.0523	0.0009	0.0061	0.0447	0.0256	0.0050	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Inventories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rate of inventory allowance (u)	0.0286	0.0065	0.0273	0.0271	0.0081	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table A-5

Tax Rates for Different Types of Income and Investor

	Type of investor		
	Household	Tax-exempt institution	Life insurance company
Type of income			
Interest	m	0	m_l
Dividends	$\theta m - (\theta - 1)$	0	$\phi m_l - (\phi - 1)$
Capital gains	z	0	$\phi z_l(1 - m_l) + \phi m_l - (\phi - 1)$

m = marginal personal tax rate on investment income.
m_l = marginal personal tax rate on investment income accruing on life insurance policies.
θ = the rate at which dividends are grossed up.
$\theta - 1$ = dividend tax credit rate.
$\phi = 1/(1 - \tau_l)$, where τ_l is the statutory corporation tax rate on life insurance companies.
z = effective accrued personal tax rate on capital gains realized by households.
z_l = effective accrued tax rate on capital gains realized by life insurance companies.

Table A-6

Tax Parameters, by Source of Finance

	1980			1985			1986 federal budget			1987 White Paper		
	Debt	New shares	Retained earnings	Debt	New shares	Retained earnings	Debt	New shares	Retained earnings	Debt	New shares	Retained earnings
Household wealth tax rates (w_r)												
Households	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tax-exempt institutions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Insurance companies	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tax rates on interest (m)												
Households	0.291	0.423	0.423	0.318	0.423	0.423	0.318	0.423	0.423	0.316	0.416	0.416
Tax-exempt institutions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Insurance companies	0.140	0.211	0.211	0.159	0.211	0.211	0.159	0.211	0.211	0.158	0.208	0.208
Tax rate on capital gains (z_r)												
Households	0.221	0.211	0.211	0.211	0.211	0.211	0.000	0.000	0.000	0.103	0.103	0.103
Tax-exempt institutions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Insurance companies	0.248	0.248	0.248	0.249	0.249	0.249	0.234	0.234	0.234	0.209	0.209	0.209

Table A-7

Weights[1]

	Manufacturing	Other industry	Commerce
Proportion of capital stock			
Machinery	0.2289	0.1118	0.0966
Buildings	0.1272	0.1564	0.0704
Inventories	0.0970	0.0060	0.1047
Proportion by method of finance			
Debt	0.3473	0.3740	0.5091
New share issues	0.0877	0.0811	0.0660
Retained earnings	0.5650	0.5419	0.4249
Ownership shares			
Debt			
Households	0.728	0.728	0.728
Tax-exempt institutions	0.212	0.212	0.212
Insurance companies	0.060	0.060	0.060
New shares			
Households	0.838	0.838	0.838
Tax-exempt institutions	0.148	0.148	0.148
Insurance companies	0.014	0.014	0.014
Retained earnings			
Households	0.838	0.838	0.838
Tax-exempt institutions	0.148	0.148	0.148
Insurance companies	0.014	0.014	0.014

1 These weights are derived using precisely the same methodology as that described by Daly *et al.* (1985) in their Appendix C.

Table A-8

Specific Tax and Inventory Parameters Used in the Calculations for the United Kingdom, Japan, and the United States

	United Kingdom		Japan		United States	
	1985	After tax reform	1985	After tax reform	1985	After tax reform
τ (Corporation tax rate)						
Manufacturing	0.450	0.350	0.5763	0.528	0.49500	0.38300
Other industry	0.450	0.350	0.5763	0.528	0.49500	0.38300
Commerce	0.450	0.350	0.5763	0.528	0.49500	0.38300
θ (Opportunity cost of retained earnings in terms of gross dividends forgone)	1.429	1.370	1.133	1.000	1.00000	1.00000
ν (Proportion of inventories taxed under FIFO)	0.000	0.000	0.100	0.100	0.00000	0.00000
Corporate wealth tax rates (w_c)						
Machinery						
Manufacturing	0.000	0.000	0.0059	0.0059	0.00768	0.00768
Other industry	0.000	0.000	0.0059	0.0059	0.00768	0.00768
Commerce	0.000	0.000	0.0059	0.0059	0.00768	0.00768
Buildings						
Manufacturing	0.0246	0.0344	0.0032	0.0032	0.01126	0.01126
Other industry	0.0246	0.0344	0.0032	0.0032	0.01126	0.01126
Commerce	0.0246	0.0344	0.0032	0.0032	0.01126	0.01126
Inventories						
Manufacturing	0.000	0.000	0.000	0.000	0.00768	0.00768
Other industry	0.000	0.000	0.000	0.000	0.00768	0.00768
Commerce	0.000	0.000	0.000	0.000	0.00768	0.00768
Sales tax rate (h)						
Machinery						
Manufacturing	0.000	0.000	0.000	0.000	0.0000	0.00000
Other industry	0.000	0.000	0.000	0.000	0.0000	0.00000
Commerce	0.000	0.000	0.000	0.000	0.0000	0.00000
Buildings						
Manufacturing	0.000	0.000	0.000	0.000	0.0000	0.00000
Other industry	0.000	0.000	0.000	0.000	0.0000	0.00000
Commerce	0.000	0.000	0.000	0.000	0.0000	0.00000
Inventories						
Manufacturing	0.000	0.000	0.000	0.000	0.0000	0.00000
Other industry	0.000	0.000	0.000	0.000	0.0000	0.00000
Commerce	0.000	0.000	0.000	0.000	0.0000	0.00000

Table A-9

Tax Parameters, by Method of Finance, United Kingdom, Japan, and the United States

	United Kingdom							
	1985			After tax reform			1985	
	Debt	New shares	Retained earnings	Debt	New shares	Retained earnings	Debt	New shares
Personal household tax rates (w_p)								
Households	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tax-exempt institutions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Insurance companies	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tax rates on interest (m)								
Households	0.266	0.390	0.390	0.245	0.360	0.360	0.1244	0.1809
Tax-exempt institutions	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.0000
Insurance companies	0.375	0.300	0.300	0.308	0.270	0.270	0.5763	0.5763
Tax rate on capital gains (z_p)								
Households	0.000	0.000	0.000	0.175	0.175	0.175	0.000	0.000
Tax-exempt institutions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Insurance companies	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300

Japan				United States					
	After tax reform			1985			After tax reform		
Retained earnings	Debt	New shares	Retained earnings	Debt	New shares	Retained earnings	Debt	New shares	Retained earnings
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1809	0.200	0.200	0.200	0.258	0.396	0.396	0.224	0.320	0.320
0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.5763	0.528	0.528	0.528	0.368	0.069	0.069	0.340	0.068	0.068
0.000	0.200	0.200	0.200	0.118	0.118	0.118	0.220	0.220	0.220
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.300	0.300	0.300	0.300	0.280	0.280	0.280	0.340	0.340	0.340

Table A-10

Parameters for Each Asset, by Industry, United Kingdom, Japan, and the United States

	United Kingdom							
	1985			After tax reform			1985	
	Manufacturing	Other industry	Commerce	Manufacturing	Other industry	Commerce	Manufacturing	Other industry
Depreciation rates (δ)								
Machinery	0.0819	0.1535	0.0831	0.0819	0.1535	0.0831	0.0666	0.0900
Buildings	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0222	0.0248
Inventories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Proportion with immediate depreciation (f_2)								
Machinery	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0250	0.0627
Buildings	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0250	0.0627
Inventories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0250	0.0627
Proportion with later depreciation (f_1)								
Machinery	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9750	0.9373
Buildings	1.0000	1.0000	0.5000	1.0000	1.0000	0.5000	0.9750	0.9373
Inventories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9750	0.9373
Proportion with investment grant (f_3)								
Machinery	0.4000	0.0040	0.0040	0.4000	0.0040	0.0000	0.0000	0.0000
Buildings	0.5000	0.0070	0.0070	0.5000	0.0070	0.0000	0.0000	0.0000
Inventories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rate of investment grant (g)								
Machinery	0.1946	0.1946	0.1946	0.1500	0.1500	0.0000	0.0000	0.0000
Buildings	0.1476	0.1476	0.1476	0.1500	0.1500	0.0000	0.0000	0.0000
Inventories	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Rate of inventory allowance (u)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Japan				United States					
	After tax reform			1985			After tax reform		
Commerce	Manufacturing	Other industry	Commerce	Manufacturing	Other industry	Commerce	Manufacturing	Other industry	Commerce
0.0910	0.0666	0.0900	0.0910	0.1331	0.1302	0.1710	0.1331	0.1302	0.1710
0.0248	0.0222	0.0248	0.0248	0.0343	0.0304	0.0247	0.0343	0.0304	0.0247
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0095	0.0250	0.0627	0.0095	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0095	0.0250	0.0627	0.0095	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0095	0.0250	0.0627	0.0095	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.9905	0.9750	0.9375	0.9905	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.9905	0.9750	0.9375	0.9905	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.9905	0.9750	0.9375	0.9905	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table A-11

Weights for the United Kingdom, Japan, and the United States

	United Kingdom			Japan			United States		
	Manufac-turing	Other industry	Com-merce	Manufac-turing	Other industry	Com-merce	Manufac-turing	Other industry	Com-merce
Proportion of capital stock									
Machinery	0.298	0.090	0.080	0.2345	0.1188	0.0376	0.0867	0.0965	0.0415
Buildings	0.171	0.022	0.139	0.1544	0.0789	0.0518	0.2167	0.1970	0.1248
Inventories	0.135	0.005	0.060	0.1185	0.0751	0.1304	0.1350	0.0176	0.0842
Proportion by method of finance									
Debt	0.193	0.193	0.193	0.3983	0.5983	0.4368	0.1981	0.4847	0.3995
New share issues	0.044	0.044	0.044	0.0492	0.0329	0.0461	0.0592	0.0381	0.0443
Retained earnings	0.763	0.763	0.763	0.5525	0.3688	0.5171	0.7427	0.4772	0.5562
Ownership shares									
Debt									
Households	0.718	0.718	0.718	0.8586	0.8586	0.8586	0.6094	0.6094	0.6094
Tax-exempt institutions	0.137	0.137	0.137	0.0196	0.0196	0.0196	0.2371	0.2371	0.2371
Insurance companies	0.145	0.145	0.145	0.1216	0.1216	0.1216	0.1534	0.1534	0.1534
New shares									
Households	0.435	0.435	0.435	0.7615	0.7615	0.7615	0.7433	0.7433	0.7433
Tax-exempt institutions	0.407	0.407	0.407	0.0333	0.0333	0.0333	0.2154	0.2154	0.2154
Insurance companies	0.157	0.157	0.157	0.2051	0.2051	0.2051	0.0412	0.0412	0.0412
Retained earnings									
Households	0.435	0.435	0.435	0.7615	0.7615	0.7615	0.7433	0.7433	0.7433
Tax-exempt institutions	0.407	0.407	0.407	0.0333	0.0333	0.0333	0.2154	0.2154	0.2154
Insurance companies	0.157	0.157	0.157	0.2051	0.2051	0.2051	0.0412	0.0412	0.0412

Appendix B

Table B-1

Marginal Effective Tax Rates, Fixed-*r*, Corporate Sector, 1985[1]

	Total (1)	Personal (2)	Corporate (including sales and property taxes) (3)	Corporate (excluding sales and property taxes) (4)	Total (excluding sales and property taxes) (5)	Total (excluding sales taxes) (6)	Total (excluding property taxes) (7)
				(Per cent)			
Industry							
Manufacturing	42.9	31.5	16.7	4.0	34.2	41.6	35.8
Other industry	54.4	32.0	32.9	15.4	42.5	51.2	47.0
Commerce	51.6	34.5	26.0	4.4	37.4	46.2	44.5
Asset							
Machinery	39.1	32.4	9.9	–7.9	27.0	27.0	39.1
Buildings	57.8	32.4	37.6	12.3	40.7	57.8	40.7
Inventories	48.0	33.1	22.3	22.3	48.0	48.0	48.0
Method of finance							
Debt	25.7	40.8	–25.5	–61.0	4.6	19.9	12.7
New share issues	61.6	23.1	50.1	40.4	54.2	59.5	56.8
Retained earnings	61.1	21.6	50.4	40.6	53.4	59.0	56.2
Owner							
Households	59.4	44.9	26.3	8.2	49.5	56.7	53.1
Tax-exempt institutions	22.3	0.0	22.3	9.6	9.6	18.2	14.6
Insurance companies	4.1	9.6	–6.0	–36.9	–23.8	–3.3	–13.3
Overall tax rate	49.0	32.5	24.5	7.5	37.6	45.8	41.8
Tax wedge	3.3	1.7	1.6	0.4	2.1	2.9	2.5
Weighted standard deviation	39.1	27.7	56.7	63.7	44.2	43.2	41.0

1 These estimates are based on a 5-per-cent expected annual inflation rate.

Table B-2

Marginal Effective Corporate Tax Rates, Fixed-*r*, Corporate Sector, 1985

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	20.2	16.7	15.8
Other industry	36.7	32.9	25.1
Commerce	33.1	26.0	23.5
Asset			
Machinery	13.7	9.9	2.2
Buildings	43.5	37.6	28.0
Inventories	23.8	22.3	34.9
Method of finance			
Debt	8.3	–25.5	–55.0
New share issues	41.4	50.1	56.2
Retained earnings	41.2	50.4	58.0
Owner			
Households	30.1	26.3	23.0
Tax-exempt institutions	27.3	22.3	19.8
Insurance companies	17.0	–6.0	–28.2
Overall tax rate	29.1	24.5	20.9
Weighted standard deviation	31.3	56.7	91.0

Table B-3

Marginal Effective Total Tax Rates, Fixed-*r*, Corporate Sector, 1985

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	33.9	42.9	50.3
Other industry	47.9	54.4	56.2
Commerce	45.9	51.6	57.2
Asset			
Machinery	29.0	39.1	43.2
Buildings	53.6	57.8	58.1
Inventories	37.7	48.0	62.6
Method of finance			
Debt	30.4	25.7	21.8
New share issues	47.2	61.6	71.6
Retained earnings	48.6	61.1	69.6
Owner			
Households	46.3	59.4	69.9
Tax-exempt institutions	27.3	22.3	19.8
Insurance companies	22.0	4.1	–13.7
Overall tax rate	41.8	49.0	54.1
Weighted standard deviation	24.7	39.1	61.3

Table B-4

Marginal Effective Corporate Tax Rates, Fixed-*r*, Corporate Sector, 1980

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	21.7	17.6	17.7
Other industry	34.1	29.8	21.6
Commerce	29.8	22.1	20.8
Asset			
Machinery	8.8	3.0	–6.8
Buildings	42.7	36.7	26.7
Inventories	25.2	22.8	36.3
Method of finance			
Debt	4.9	–33.5	–65.5
New share issues	40.7	49.8	56.9
Retained earnings	40.5	50.0	58.7
Owner			
Households	28.6	24.2	21.8
Tax-exempt institutions	25.8	20.6	19.0
Insurance companies	14.4	–11.7	–35.0
Overall tax rate	27.6	22.4	19.7
Weighted standard deviation	31.2	62.4	111.4

Table B-5

Marginal Effective Total Tax Rates, Fixed-*r*, Corporate Sector, 1980

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	34.5	42.2	49.8
Other industry	45.0	51.2	52.6
Commerce	42.4	47.3	53.6
Asset			
Machinery	24.0	32.7	35.6
Buildings	52.3	56.2	55.9
Inventories	38.0	46.9	62.0
Method of finance			
Debt	25.9	16.5	10.3
New share issues	46.5	61.4	72.4
Retained earnings	47.9	60.9	70.4
Owner			
Households	44.3	56.5	67.3
Tax-exempt institutions	25.8	20.6	19.0
Insurance companies	18.3	–4.1	–24.4
Overall tax rate	39.8	46.3	51.8
Weighted standard deviation	25.0	43.9	74.8

Table B-6

Marginal Effective Total Tax Rates before and after Tax Reform, Fixed-*r*, Corporate Sector[1]

	1985 (1)	1986 budget package[2] (2)	1987 White Paper stage one (3)	White Paper stage two (national VAT) (4)	White Paper stage two (federal VAT) (5)
			(Per cent)		
Industry					
Manufacturing	42.9	44.3	49.1	48.1	48.4
Other industry	54.4	51.3	53.4	50.1	51.7
Commerce	51.6	52.0	53.6	48.7	51.3
Asset					
Machinery	39.1	37.8	44.7	35.4	40.2
Buildings	57.8	55.7	57.4	57.4	57.4
Inventories	48.0	53.0	52.9	52.9	52.9
Method of finance					
Debt	25.7	34.7	38.5	34.5	36.4
New share issues	61.6	68.1	69.4	68.0	68.6
Retained earnings	61.1	55.4	58.2	55.8	57.0
Owner					
Households	59.4	58.1	61.2	58.8	60.0
Tax-exempt institutions	22.3	26.0	26.8	23.2	25.0
Insurance companies	4.1	16.2	27.3	23.5	25.4
Overall tax rate	49.0	48.7	51.6	48.8	50.2
Weighted standard deviation	39.1	27.8	23.0	25.4	24.1

1 These estimates are based on a 5-per-cent expected annual inflation rate.
2 Includes $500,000 personal lifetime capital gains exemption.

Table B-7

Marginal Effective Corporate Tax Rates before and after Tax Reform, Fixed-*r*, Corporate Sector[1]

	1985 (1)	1986 budget package (2)	1987 White Paper stage one (3)	White Paper stage two (national VAT) (4)	White Paper stage two (federal VAT) (5)
			(Per cent)		
Industry					
Manufacturing	16.7	25.2	28.8	27.4	27.8
Other industry	32.9	33.7	34.2	29.6	31.9
Commerce	26.0	30.7	31.7	24.6	28.4
Asset					
Machinery	9.9	14.7	21.6	8.3	15.1
Buildings	37.6	39.2	39.6	39.6	39.6
Inventories	22.3	34.3	32.4	32.4	32.4
Method of finance					
Debt	–25.5	–10.3	–1.0	–7.6	–4.4
New share issues	50.1	48.7	46.7	44.3	45.4
Retained earnings	50.4	56.1	53.0	50.4	51.7
Owner					
Households	26.3	31.5	32.5	28.4	30.4
Tax-exempt institutions	22.3	26.0	26.8	23.2	25.0
Insurance companies	–6.0	5.9	32.5	29.0	30.7
Overall tax rate	24.5	29.3	31.2	27.2	29.1
Weighted standard deviation	56.7	42.5	32.7	36.2	34.3

1 These estimates are based on a 5-per-cent expected annual inflation rate.

Table B-8

Marginal Effective Total Tax Rates after Tax Reform,[1] Fixed-*r*, Corporate Sector

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	36.5	48.1	54.4
Other industry	43.0	50.1	52.8
Commerce	38.0	48.7	54.8
Asset			
Machinery	22.6	35.4	41.4
Buildings	53.4	57.4	58.6
Inventories	32.3	52.9	63.6
Method of finance			
Debt	31.2	34.5	34.5
New share issues	50.8	68.0	77.3
Retained earnings	42.5	55.8	64.1
Owner			
Households	43.0	58.8	69.8
Tax-exempt institutions	25.4	23.2	20.3
Insurance companies	26.9	23.5	19.3
Overall tax rate	38.8	48.8	54.1
Weighted standard deviation	18.2	25.4	35.2

1 Assumes a national VAT.

Table B-9

Marginal Effective Corporate Tax Rates after Tax Reform,[1] Fixed-*r*, Corporate Sector

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	25.6	27.4	26.1
Other industry	32.9	29.6	22.7
Commerce	25.3	24.6	22.4
Asset			
Machinery	8.7	8.3	3.4
Buildings	44.9	39.6	31.7
Inventories	19.5	32.4	39.2
Method of finance			
Debt	10.6	–7.6	–25.4
New share issues	37.4	44.3	47.0
Retained earnings	38.8	50.4	58.0
Owner			
Households	28.2	28.4	25.4
Tax-exempt institutions	25.4	23.2	20.3
Insurance companies	28.8	29.0	27.6
Overall tax rate	27.6	27.2	24.1
Weighted standard deviation	23.0	36.2	52.4

1 Assumes a national VAT.

Table B-10

Marginal Effective Total Tax Rates, Fixed-*r*, Noncorporate Sector, 1985

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	29.6	37.4	44.5
Other industry	40.3	46.3	49.2
Commerce	41.8	49.5	54.5
Asset			
Machinery	23.6	33.0	38.3
Buildings	47.1	51.4	53.0
Inventories	35.9	45.8	60.1
Method of finance			
Debt	36.2	48.0	66.0
Proprietors' equity	36.2	42.0	46.1
Owner			
Households	36.2	43.4	49.5
Overall tax rate	36.2	43.4	49.5
Weighted standard deviation	18.3	21.5	49.6

Table B-11

Marginal Effective Total Tax Rates after Tax Reform,[1] Fixed-*r*, Noncorporate Sector

	Expected inflation rate		
	0	5	10
	(Per cent)		
Industry			
Manufacturing	35.8	45.2	50.6
Other industry	42.6	48.2	50.9
Commerce	42.4	53.0	60.0
Asset			
Machinery	32.4	41.3	46.1
Buildings	48.9	52.8	54.2
Inventories	33.4	52.1	62.7
Method of finance			
Debt	41.1	56.7	73.1
Proprietors' equity	38.9	45.2	48.3
Owner			
Households	39.6	48.2	53.3
Overall tax rate	39.6	48.2	53.3
Weighted standard deviation	10.5	10.2	14.3

1 Assumes a national VAT.

Table B-12

Marginal Effective Total Tax Rates for Owner-Occupied Housing, Fixed-*r*

	Expected inflation rate		
	0	5	10
	(Per cent)		
1980	19.7	21.4	23.0
1985	21.9	23.7	25.3
After tax reform	22.0	23.7	25.4

Notes

Chapter 1

1 See Daly *et al.* (1985, 1986, 1987), and Daly and Jung (1987).

Chapter 2

1 See, for example, Jenkins (1977).

2 For a more exhaustive discussion of these issues, see Fullerton (1984).

3 Note that t_c and t_p do not add up to t. For this to be the case, the marginal effective personal tax rate would have to be defined as $(x - s)/p$.

4 The CCA formulae used to calculate A_d are available from the authors upon request.

5 Therefore, in this case the cost of capital depends on personal tax rates which in general differ between shareholders according to their tax brackets.

6 As pointed out by King and Fullerton (1984), this does not necessarily mean that inflation actually adds more than point-for-point to nominal interest. It is instead a consequence of the standard they use for comparison across inflation rates.

7 Notice that because the personal tax treatment accorded capital income differs depending on whether it is paid in interest, distributed as dividends, or retained by the firm (thus creating capital gains), net returns to different investments must vary according to their method of finance. Consequently, so long as one ignores risk, one can assume that individuals arbitrage away differences in the net rate of return or that firms arbitrage away differences in the sources of finance – but not both. See Bradford and Fullerton (1981).

8 Alternatively, one could assume that arbitrage takes place only in the international bond market.

9 See Bulow and Summers (1984) for a more detailed description of capital risk. Jog and Mintz (1987) have computed estimates of marginal effective tax rates for Canada taking capital risk into account.

10 See Feldstein and Horioka (1980), Feldstein (1983), and Summers (1986). This phenomenon may be partly explained by the fact that integration of corporate and personal income taxes is a device used in many countries, including Canada, to encourage the investment of savings at home rather than abroad. The phenomenon may also be partly due to investors' relative lack of familiarity with foreign investment opportunities and restrictions placed on the proportion of pension funds that can be invested abroad.

11 See Statistics Canada (1986).

12 For a more detailed discussion of the arguments summarized here, see Hartman (1985), Warren (1986), and Eden (1987).

Chapter 3

1 See Canada (1966).

2 The additional burden on distributed profits imposed by the corporation tax is measured by $\theta(1 - \tau)$, where θ denotes the opportunity cost of retained earnings in terms of gross dividends forgone, and τ is the rate of corporation tax. This measure of integration is known as the ACID Test Statistic (see King [1977] p. 57). A value of zero implies complete confiscation of dividend income by the corporation tax, while a value of unity means that the corporation tax imposes no tax on dividends over and above the level of personal taxation. For large companies, the ACID Test Statistic rose from a value of 0.72 in 1972 to 0.81 in 1977, and remained at roughly the same value until 1987. The increase in value was due to the increase in the dividend tax credit from 33 1/3 to 50 per cent of grossed-up dividends in 1977.

3 If a person's contributions to RRSPs and pension plans are tax-deductible, and savings accumulated in such plans are fully taxable upon withdrawal with no transfers of RRSP assets allowed between individuals, these schemes involve a step toward a *lifetime-income* tax. Insofar as transfers of wealth are allowed through such plans (between spouses, for example), the gradual relaxation of limits on contributions to RRSPs and pension plans constitutes a move in the direction of a *lifetime-expenditure* tax. The current tax treatment of saving via these plans entails a mixture of the two types of taxes.

4 Starting in 1972, firms engaged in manufacturing and processing were able to write off investments in machinery and equipment at a straight-line rate of 50 per cent per annum. In 1981, however, the half-year convention was adopted so that it then took three instead of two tax years to write off expenditures on such assets.

5 These incentives were implemented partly in response to the introduction of the Domestic International Sales Corporation (DISC) program and the investment tax credit in the United States.

6 ISIPs were introduced in 1983 in order to allow full indexation of capital gains realized on the disposition of shares in Canadian companies. Little use was made of these plans, however, and they were withdrawn in 1985 when the $500,000 personal lifetime exemption for capital gains was announced. Consequently, the estimates or marginal effective tax rates for 1985 reported later in this paper ignore such plans.

7 See Auld (1985, p. 84).

8 See Kuo, McGirr, and Poddar (1985).

9 This is an approximation. The actual method of calculating the dividend tax credit is as follows. Dividends are grossed up by 50 per cent as mentioned. Federal taxes are calculated and a tax credit of 34 per cent of the dividend paid (or 22 2/3 per cent of the grossed- up dividend) is given against federal taxes. Provincial taxes are then calculated as a percentage of federal taxes, thus compounding the tax credit. For example, the Ontario statutory tax rate in 1984 was 48 per cent of federal taxes. Therefore, the dividend tax credit was 22 2/3% + (0.48) × (22 2/3%) = 33.55 per cent, which is roughly equivalent to a system that gives a tax credit equal to the amount of grossing-up of dividends. The amount of the difference varies from province to province. See Boadway and Kitchen (1984, pp. 155-156).

10 The subsequent marginal personal tax rates are generated by the tax simulation model using the 1984 tax structure and data on a sample of 1981 tax filers.

11 $m_e = [\hat{m}_e + (\theta - 1)] + \theta = [0.134 + (1.5 - 1)] + 1.5 = 0.423.$

12 The effective accrued tax (EAT) rate, z, equals the statutory tax rate, z_s, multiplied by the EAT ratio. In 1985, $z_s = 0.5\ m$. The EAT ratio = $\lambda/(\lambda + s + \pi)$ where π is the expected inflation rate (5.0 per cent), λ denotes the proportion of capital gains realized by investors in each period (10 per cent), and s is the post-tax rate of return to the investor. See King (1977), p. 74.

13 $m_d = \theta\, \hat{m}_d - (\theta - 1) = 1.5 \times 0.318 - (1.5 - 1) = -0.023.$

14 Implicit in our model is the assumption that the personal income tax rate against which contributions to pension schemes and RRSPs are deducted is the same as the rate at which retirement benefits are taxed when paid out. In practice, however, most individuals likely face higher tax rates during their working lives, when contributing to pension schemes and RRSPs, than when they receive retirement income. To the extent that tax rates fall after retirement, the personal tax rate on income from pension and RRSP funds is negative rather than zero. Consequently, our subsequent calculations probably overstate the marginal effective tax rate on capital income for this category of saver.

15 As mentioned in footnote 3, the current tax treatment of RRSPs and pension plans also contains elements of a lifetime expenditure tax.

16 A more detailed discussion of this tax rate and other aspects of life insurance can be found in Dahlby and Macnaughton (1986).

17 This rate is calculated by adding the 36-per-cent federal rate to a weighted average provincial rate of 13.7 per cent. The latter is calculated by weighting the general provincial corporation tax rates by the provincial distribution of premiums collected by life insurance companies.

18 z_l is computed in exactly the same way as z in supra footnote 12 except that $z_s = 0.5\ \tau_l$. The EAT ratio for life insurance companies was found to be 0.23.

19 See Canada, Department of Finance (1985).

20 See Canada, Department of Finance (1986).

21 See Canada, Department of Finance (1987), p. 2.

22 See Economic Council of Canada (1987).

Chapter 4

1 Our calculations assume that a typical household investing in corporate bonds faces a marginal personal tax rate of 31.8 per cent, whereas a typical shareholder faces a rate of 42.3 per cent. The rate for shareholders is higher because dividends are concentrated more heavily than interest income among persons in high-income brackets. Hence the variation in effective tax rates is caused in part by the fact that marginal personal tax rates rise with income. It follows that further disaggregation of households by income groups would lead to more variation in effective tax rates.

2 Our own calculation of a weighted average for all savers.

3 Some features of the existing tax system were introduced in order to counteract the impact of inflation. In the absence of inflation, these features would probably be withdrawn, since otherwise they would cause a considerable decline in tax revenue. Consequently, our calculations with zero inflation assume that there is no inventory allowance. We do not, however, take into account the likely reductions in ITCs and CCAs.

4 The marginal effective corporate tax rate associated with inventories increases as inflation rises from 0 to 5 per cent

because the estimates with zero inflation assumed no inventory allowance.

5 See Jenkins (1985).

6 Since no data were available concerning the marginal personal tax rate applicable to capital gains if there were a $500,000.00 lifetime exemption, it was assumed that the effective accrued tax rate would be zero. Judging from Lawlor (1986), this assumption is a reasonable approximation.

7 Three types of VAT are actually being considered: an invoice-based national sales tax which would replace both the federal sales tax and provincial retail sales taxes; and two forms of federal VAT, one with explicit invoicing along European lines and the other without such invoicing. In all three cases, purchases of capital and intermediate inputs, as well as export sales, would be exempted.

8 The degree of integration, as measured by the ACID Test Statistic, for large nonmanufacturing companies, would fall from 0.810 in 1985 to 0.775 if the White Paper were implemented, and would drop from 0.900 to 0.837 in the case of large manufacturing companies.

9 For details of the manner in which these proportions are calculated, see Mercier (1987).

Chapter 5

1 The estimates of marginal effective tax rates for the United States were provided by Don Fullerton and Marios Karayannis based on the tax model described in Fullerton and Karayannis (1987). Estimates for the United Kingdom and Japan were computed from PTAX and PTAXJAP, respectively, both of which are programs developed by Mervyn King.

2 The data used to compute marginal effective tax rates for the United States, the United Kingdom, and Japan are summarized in Tables A-8 to A-11 of Appendix A.

3 Note that the economic depreciation parameters used to compute marginal effective tax rates for Canada are derived from estimates of asset lives provided by Statistics Canada. These estimates are in some cases greater than those found by Hulten and Wykoff (1981) for similar types of assets in the United States and which were used in computing marginal effective tax rates for the United States. If the estimates by Hulten and Wykoff were used for Canada, the marginal effective tax rate associated with machinery would be somewhat higher than the rates reported in Tables 5-1 and 5-2. Nevertheless, the effective tax rate applicable to machinery in Canada would still be considerably smaller than the rate applicable to buildings and inventories.

4 The low overall tax rate in Japan compared to Canada is mainly attributable to the combination of relatively high debt-equity ratios and the effective tax subsidy applied to marginal investments financed with debt in Japan.

5 Note that this effective subsidy arises because the withholding tax associated with a dividend payment is regarded as satisfying a personal instead of a corporation tax liability.

6 For a more detailed discussion of the tax systems and recent tax reform measures in the United States, the United Kingdom, and Japan, see Fullerton and Karayannis (1987), Morris (1986), Shoven and Tachibanaki (1986), and Iwata and Yoshida (1987).

7 See Iwata and Yoshida (1987).

8 The rise in the overall marginal effective tax rate in Canada would, of course, be accentuated if the proposed value-added tax replaces federal but not provincial sales taxes.

Chapter 6

1 For a more detailed description of how the corporation tax could be indexed, see Economic Council of Canada (1987), Chapter 6.

2 A cash-flow business tax can thus be viewed as a tax on profits plus interest, under which all investment expenditures are immediately deductible. An alternative cash-flow base is the excess of inflows over outflows of funds in "financial" as well as "real" transactions. This base, which the Meade committee (infra footnote 3) called the "R & F base," would include the proceeds from net borrowing, whereas net interest payments would be deductible. It is noteworthy that the Confederation of British Industry recently endorsed the latter kind of cash-flow tax. See Confederation of British Industry (1985).

3 See Institute for Fiscal Studies (1978), referred to as "the Meade committee report," and Economic Council of Canada (1987).

4 Under a personal cash-flow tax, individuals would pay taxes on capital income when they spent it on consumption. A personal tax that exempted all capital income, combined with a corporate cash-flow tax, would give a similar outcome.

5 An identical result would obtain if income that accrued from RRSPs were tax exempt and if all restrictions on contributions (and withdrawals) to such plans were removed. See Daly and Naqib (1985, 1987).

6 One of the most frequently cited obstacles to the adoption of cash-flow taxes by Canada, especially at the corporate level,

is uncertainty over the creditability of such taxes under the existing tax system in the United States, Canada's principal source of foreign capital. As the Economic Council of Canada points out, however, present U.S. tax legislation would not necessarily deny credits to U.S. investors for corporate cash-flow taxes paid in Canada (see supra footnote 1).

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